THE IRON TRADE REVIEW

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PIG IRON PURCHASE

BY UNITED STATES STEEL CORPORATION EXPECTED.

Mills Falling Farther Behind in Deliveries—Heavy Buying of Steel Rails.

Mills are steadily falling further behind in their deliveries, and buyers of finished materials are much more anxious than sellers to make contracts. The provision of many contracts that specifications must be filed in equal monthly amounts during the contract period has generally been a dead letter, but is now being enforced by the leading interest. The entrance of the Steel Corporation into the market as a buyer of pig iron seems to be imminent. The Corporation is operating its blast furnaces at slightly more than 95 per cent of capacity, a better rate than can be maintained regularly, and as every ton of pig iron is being used, purchases are likely to be made at any time. The Corporation operations so far this month indicate many new records, including pig iron and ingots.

Pig Iron Conditions

The leading cast iron pipe interest has purchased a large tonnage this week, and some estimates place the amount as high as 30,000 tons, but 18,000 tons is still pending in the hands of a Cleveland interest, which is also considering an offer to supply 20,000 tons of Bessemer and will not be able to make both the pipe and Bessemer iron. A large plumbing interest has bought about 7,000 tons. A sale of 20,000 tons of Bessemer has been made to the Jones & Laughlin Steel Co., making a total of 75,000 tons purchased by this company for delivery over the remainder of the year. An inquiry on a large block of eastern basic for early shipment will, it is expected, be closed immediately. One of the large independent steel companies is inquiring for 40,000 to 50,000 tons of Bessemer for the first half of next year. On southern pig iron, $14, Birmingham, for No. 2, is now the minimum. Ironton furnaces are quoting $16.50 for No. 2 for next year. Although no importations of pig iron have yet been made, there is increasing interest in negotiations which are likely to result in importations at an early date. The probability of higher trans-Atlantic freight rates on both pig iron and iron ore is an important factor; in fact, freight rates on ores have already advanced and quotations on foreign ores are also higher.

Heavy Sales of Rails

Rail sales of the past week have been extremely heavy. The Lackawanna Steel Co. has booked orders for over 40,000 tons for this year's delivery, as follows: Chicago & Alton, 1,000 tons; St. Paul, 5,000 tons; Burlington, 5,000 tons; Lake Shore, 5,000 tons; Great Northern, 2,000 tons; Northern Pacific, 20,000 tons; and Wabash, 2,500 tons. Chiefly for next year's delivery, sales of about 200,000 tons are announced by Corporation interests. The Carnegie Steel Co. has sold an aggregate of 20,000 tons. The Illinois Steel Co. has sold 90,000, including 40,000 to the Harriman lines, and the Tennessee company has booked 85,000, divided as follows: Harriman lines, 20,000; Louisville & Nashville, 30,000; Atlantic Coast Line, 10,000; and the Frisco, 25,000. Heavy inquiry is pending.

Structural Material

In structural material, there is a lull at present so far as new orders are concerned, but this is welcome to the mills, which were far behind in their deliveries. Prospects for next year are very bright. It is estimated that subway construction in New York City next year will require 200,000 tons of shapes and plates. Railroads are preparing for heavy purchases and a heavy tonnage will be required for new dock construction at the head of the lakes.

Sheets and Tin Plate

The demand for sheets is active, because industries consuming this product are very busy. As the end of the canning season approaches, there is an unusual number of rush orders for tin plate, and some independent manufacturers are getting higher prices. Although the prices on cast iron pipe show some advances in keeping with higher quotations on pig iron, recent sales show that rather low quotations are still being made in some cases. The demand for wire products is becoming stronger as the fall demand increases. Some of the contracts for the new steel plant of the Upson Nut Co., at Cleveland, have been awarded, and others will be in a few days.

Coke and Old Material

Quotations on old material in the Philadelphia district show a sharp advance, and heavy melting steel is selling at from $17.50 to $18.00. High quotations still prevail on coke and opinions of buyers and sellers differ greatly as to whether the present high prices can be maintained through the first half of next year, when it is expected production will be largely increased.

New Card Issued

The Carnegie Steel Co. has announced a new classification of extras on steel bars and shapes, abandoning the policy long in use of charging half extras. Although regret is expressed that independent interests were not consulted before making the change, the new card is generally regarded with favor, as it tends to simplify selling methods, and it probably will be adopted by the independents.

Ship Plate Demand

The awarding of contracts for building two new battleships in the east and for three freighters on the lakes will add a large tonnage to the already heavy business on the books of the plate manufacturers. Inquiries for 16,000 tons of plates and shapes from lake ship building companies are pending, and it is doubtful whether satisfactory delivery can be obtained.

THE WEEK IN IRON CENTERS

PITTSBURG.

Great Activity Continues—Mills Far Behind on Deliveries.

Office of THE IRON TRADE REVIEW,
510 Park Building, Sept. 14.

The great rush of business still continues in the Pittsburg district and there are no indications of slackened speed or that present conditions are anything but a good healthy demand for material actually needed and for which there is an urgent requirement.

Prices on shapes and plates have been advanced during the week and the leading interest has announced that its minimum steel bar prices are now 1.40c, base Pittsburg, an official advance of $1 per ton over former quotations, although this price had been quoted by other interests before the announcement. The price of semi-finished material has advanced, the pig iron inquiry has come back into the market and the sale of Bessemer and basic iron since the last report is estimated at about 65,000 tons, of which 20,000 went to the Jones & Laughlin Steel Co., bringing the purchases of that company for delivery during the remainder of the year up to approximately 75,000 tons, which will be used in addition to the capacity of its own six blast furnaces.

The Carnegie Steel Co. has 56 of its 59 furnaces in blast, two more are being prepared for operation and one of the Carrie group is being relined. So great is the demand for steel-making iron that the rail mill at Edgar Thomson plant of the Corporation is being "gaited" in order that the output of four blast furnaces at the plant may be turned over to the Homestead plant. A conservative estimate of stocks on the yards of valley furnaces is 100,000 tons, but negotiations now on may clean up this stock within the next ten days.

Deliveries on the smaller bar products are now from three to four months in the Pittsburg district and semi-finished material is exceedingly scarce, the high price of the present movement being registered on Monday of this week, when 1,000 tons of Bessemer sheet bars and 1,000 tons of small Bessemer billets sold at $27, Pittsburg, for prompt shipment.

The publication of a new classification on the steel bar card by the leading interest was one of the features of the week. This card has not yet been adopted by independent interests, but the matter is under consideration. The card abolishes the old practice of selling at half extras for other than base sizes and quotes net extras on all items.

Pig Iron.—Pig iron sales and inquiries have both been larger during the past week than for some time past, and we note the sale of 20,000 tons of Bessemer to the Jones & Laughlin Steel Co. at $17, valley. This interest has already purchased 75,000 tons of iron for delivery over the remainder of the year and has intimated that this tonnage, together with the output of its own furnaces, will meet requirements until the first of the year. Two thousand tons of basic for prompt shipment at $15.75, valley, has been purchased by a large interest for re-sale and the same interest during the week has offered to purchase 20,000 tons of Bessemer for delivery over the remainder of the year at $16.75. This offer is under consideration at Cleveland. A sale of 18,000 tons to the United States Cast Iron Pipe & Foundry Co. is also pending at Cleveland. Among the inquiries out for the first half of next year is one by a large steel-making interest for 40,000 to 50,000 tons of Bessemer. There is another inquiry out for from 3,000 to 5,000 tons of Bessemer and another for 6,000 tons, neither of which has been closed. The Steel Corporation has 56 of its 59 furnaces in blast, one of the Carrie group being out for relining and one at Steubenville and one at Zanesville are being gotten ready to go into blast. The Lowellville furnace of the Ohio Iron & Steel Co. was blown in on Bessemer Monday of this week. It is estimated by parties in position to know that the stocks of Bessemer and basic iron in the valleys are very close to 100,000 tons. Northern No. 2 foundry iron is very strong at $16 to $16.50, valley furnaces, the latter probably being nearer the market than the lower quotation. On prompt and for shipment over the remainder of the year, we quote on northern iron as follows:

Bessemer, valley	$ 17.00
Bessemer, Pittsburg	17.90
No. 2 foundry, Pittsburg	16.90 to 17.15
Gray forge, Pittsburg	15.90 to 16.15
Basic, valley	15.75 to 16.00
Basic, Pittsburg	16.65 to 16.90

Plates.—The aggregate volume and tonnage of small orders has been falling off rapidly within the past week, the condition of mill order books being such that nothing like prompt shipment can be made and this business is consequently going to jobbers who are coming in with their specifications heavier than usual, although they are not relatively as insistent as the manufacturing trade. This branch of the business has reached that stage where the question of placing an order depends almost entirely upon the delivery service. Neither the car companies nor ship yards have come in with unusual tonnages, although specifications continue to be heavy and mills are operating to capacity all along the line. We quote the present market as follows:

Tank plates, ¼-inch thick, 6¼ to 100 inches, 1.50c. Extras are as follows, per 100 pounds: Boiler and flange steel plate, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches, up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ¼-inch to and including 3/16-inch plate on thin edge, 0.10c; under 3/16 to and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—Practically every industry consuming sheets is exceedingly busy and prices are being well maintained in this district with but one or two exceptions, which do not have any particular weight in the market, and one concern which is not maintaining prices is remote from the Pittsburg territory. In view of the abnormal demand for sheet products at this time of the year, manufacturers anticipated a falling off during September, but the leading interest reports that for the first 14 days of the present month the daily average over the same period last year is practically 1,000 tons. This interest is now making delivery promises on its common sheet products of from four to six weeks and on tin mill products eight to ten weeks. Jobbers' prices at Cleveland, Chicago, St. Louis and Cincinnati are reported to have been generally advanced, particularly in the case of blue annealed and galvanized sheets. The leading interest is going to start two additional sheet mill plants within the next few days, it having made an increase of one sheet mill during the past week. The sheet plant of the La Belle Iron Works is idle on account of labor troubles. We quote present minimum prices as follows:

Blue annealed sheets, Nos. 3 to 8,

1.60c; Nos. 9 to 10, 1.65c; Nos. 11 and 12, 1.70c; Nos. 13 and 14, 1.75c; Nos. 15 and 16, 1.85c; box annealed sheets, Nos. 10 and 12, 1.85c; Nos. 13 and 14, 1.90c; Nos. 15 and 16, 1.95c; Nos. 17 to 21, 2c; Nos. 22 to 24, 2.05c; Nos. 25 and 26, 2.10c; No. 27, 2.15c; No. 28, 2.20c; No. 29, 2.25c; No. 30, 2.35c; galvanized sheets, Nos. 13 and 14, 2.25c; Nos. 15 and 16, 2.40c; Nos. 17 to 21, 2.50c; Nos. 22 to 24, 2.65c; Nos. 25 and 26, 2.85c; No. 27, 3.05c; No. 28, 3.25c; No. 29, 3.40c; No. 30, 3.65c; painted roofing sheets, $1.55 per square for No. 28 gage, 2½-inch corrugation, and galvanized roofing sheets, $2.80 per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—Although the volume of business in sheet products has been on a ratio of about 2½ to 1 in favor of sheets, there is still a very good demand for tin plate, and with the approach of the end of the canning season there has been an unusual demand for rush goods to make up shortage in requirements. Several of the independent tin plate producers are quoting on the quiet at an advance of 15 cents per base box for next year's business, the leading interest has not made a definite decision as to next year's prices, reports to the contrary notwithstanding. We quote the present market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.40 to $3.65 f. o. b. mill, Pittsburg district. Terms 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—The Carnegie Steel Co. during the past week has sold over 9,000 tons of standard rails, 3,000 tons of this going to the Pittsburg & Shawmut for extensions and 6,000 tons in small lots ranging from 500 to 1,000 tons. The Atlantic Coast Line placed 10,000 tons of open-hearth rails with the Tennessee Coal, Iron & Railroad Co. The leading interest during the week sold 1,200 tons of light rails. The 150,000 pairs of rail joints mentioned last week in connection with the Southern railway tonnage to the Tennessee company have been placed, the Carnegie company taking one-half the order in its Duquesne reinforced joints. This company secured 700 tons of the splice bars on the Atlantic Coast Line order and has sold steel ties to be placed in one mile of street car track on Penn avenue, Pittsburg. All talk of changing rail section specifications or getting special chrome or alloy rails has been lost sight of in the present rush. The Youngstown rail plant of the Carnegie Steel Co. is now running on sheet bars. The spike market is firm at the 1.70c, Pittsburg, minimum on standards, with several large tonnages placed during the week. We quote the market on Bessemer rails as follows, the base price for open-hearth rails being $30, mill:

Fifty-pound and heavier, 500-ton and over, $23; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 8-pound, $31; 12-pound, $30; 16 to 25-pound, $28; 30 to 35-pound, $28.75; 40 to 45-pound, $27; angle splice bars for standard sections, 1.50c, Pittsburg; standard spikes, 1.70c to 1.75c, Pittsburg; hand spikes, 1.75c to 1.85c, Pittsburg.

Steel.—The sale of 1,000 tons of small Bessemer billets at $27, Pittsburg, for prompt shipment, and a refusal of a like amount which was offered at the same figure for the same delivery have been the only tests on the price of this commodity of semi-finished steel during the week, aside from the sale of 1,000 tons of Bessemer sheet bars for October delivery at $27. This is an advance of practically $2 a ton on billets and a $1 advance on Bessemer sheet bars. At least $1 more than these prices could be obtained for open-hearth material if any of the sellers of semi-finished steel had a surplus for sale into the open market. Billets, slabs and sheet bars, both Bessemer and open-hearth, are extremely scarce. The manufacturers are experiencing considerable difficulty in securing enough of this material to supply the needs of their own finishing mills and the sales reported were more in the nature of favors than a business transaction. Except in special instances, it is not likely that any large tonnages of semi-finished material will be sold on new contracts between now and the first of the year, and buyers who have not already covered for their requirements will have difficulty in getting their supply. One reason the Edgar Thomson rail mill is not running more than 60 per cent of capacity is that the plant has been gaited because four of the blast furnaces at the plant are required to furnish iron for the Homestead plant.

Bessemer 4 x 4 billets with 0.25 carbon and less are regularly quoted at $26.50 to $27, Pittsburg, with the usual extras for size and analysis, and open-hearth rolling billets from $27 to $27.50, Pittsburg. Forging billets are held at $29 to $30, Pittsburg. Sheet and tin bars are quoted at $27, Pittsburg.

Hoops and Bands.—During the past week, the market has shown a decided strengthening tendency and new business with specifications in fair volume are being received. On bands there has been an advance of $1 a ton and 1.40c, base, is now the minimum. We quote the market as follows:

Hoops in carload lots, 1.50c to 1.60c; in less than carload lots, 1.60c to 1.70c; bands, 1.35c to 1.40c, base half extras as per standard steel.

Merchant Bars.—The feature of the week aside from the official advance to 1.40c base, Pittsburg, on merchant steel bars, has been the appearance of a new classification of extras on steel bars and shapes, differing from former classifications in that all extras shown are net instead of half extras as on the old card. The new card also shows it to be the purpose of the company issuing it to quote as is now done on the hoop list, a base price, plus net extras. Several new sizes appear on the card. There is a decline in price of 10 cents per 100 pounds throughout on hexagon and a decline from 5 to 10 cents on ovals together with a change in the quantity differential and the item referring to cutting to specified lengths. A fuller detailed report of the changes on the steel bar card is shown in another part of this issue. The heavy specifications against existing contracts continue at an unprecedented rate and the leading interest is making delivery promises of from three to four months on the range of its bar rollings, while an independent company in the Pittsburg district is quoting about the same time on the smaller sizes of rounds, squares and flats and 90 days on the heavier sizes. The advances in price to 1.40c base, Pittsburg, on steel bars, base sizes, was announced by the leading interest, independents making no special announcement of an advance but quoting the new prices, which are now the minimum on new business. On Sept. 14 jobbers reported an advance of $1 per ton or 1.80c on bars selling from stock. We quote the present market as follows:

Common iron bars, 1.50c to 1.55c, Pittsburg; Bessemer and open-earth steel bars, 1.40c; plow and cultivator, 1.35c to 1.40c; channels, angles, zees, tees, under 3-inch, 1.45c; all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds, 0.15c advance; less than 1,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 57 per cent in carloads and 52 per cent in

less than carloads, delivered in base territory.

On cold rolled strip steel, width 1½ inches and wider, and 0.100 inch and thicker, we quote base prices for 100 pounds, $3.05 on hard, and $3.30 on soft.

Structural Material.—Mill conditions are becoming more congested each day and deliveries more distant. This tonnage has been fully specified for from two to three months ahead and fabricators, because of the big demand, are not getting the service they would like to receive at this time of the year when they are rushing to completion projects now under way. The inquiry being received by fabricators is not heavy on new work although all the conditions surrounding the trade are extremely active, and plant operations are now on a percentage larger than at any time during the past two years. The only new inquiry of any size reported in this territory is for the new Point bridge across the Monongahela river at Pittsburg. The specifications are expected within the next two or three weeks. Jobbers have advanced prices $1 per ton or 1.90c for shapes sold out of stock. We quote the present market on structural shapes as follows:

Beams and channels, 15-inch and under, 1.50c; over 15 inches, 1.50c to 1.55c; zees, 1.40c to 1.45c; tees, 1.40c to 1.45c; angles, from 3 to 6 inches, 1.40c to 1.45c; over 6 inches, 1.50c to 1.55c; universal and sheared plates, 6¼ inches wide and wider, 1.50c.

Merchant Pipe.—Activity in every department is reported by manufacturers of merchant pipe and several independents have practically withdrawn all quotations and are out of the market for any delivery during the next three or four months. Aside from the inquiry for 15 miles of 16-inch pipe noted last week, nothing new in the way of line inquiries has appeared. Mills are everywhere running to capacity and shipments are becoming more tardy each week. We quote the following official discounts on merchant pipe subject to an additional one point and five off to jobbers:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch.....	72	56	66	..
⅜ inch	73	59	67	53
½ inch	76	64	70	58
¾ to 6 inch	80	70	74	64
7 to 12 inch	75	60	69	52
PLUGGED AND REAMED.				
1 to 4 inch	78	68	72	62
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	65	53	59	47
½ to 4 inch	72	60	56	54
4½ to 8 inch	68	56	62	50
DOUBLE EXTRA STRONG PLAIN ENDS.				
½ to 8 inch.....	61	50	55	44

Boiler Tubes.—New business on boiler tubes is not particularly active, although the mills are busy turning out goods specified on old contracts. This market differs from merchant pipe in that material is contracted for further in advance and at special times during the year, so that current new business is seldom very heavy. We quote the following official discounts on lap-welded steel boiler tubes to jobbers in carloads:

1 to 1½ inch	50
1¾ to 2¼ inch	62
2½ inch	64
2¾ to 5 inch	70
6 to 13 inch	62

2½ inch and smaller, over 18 feet, 10 per cent net extra.

2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destinations east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

We quote the following official discounts on charcoal iron tubes to jobbers:

1 to 1½ inch	45
1¾ to 2¼ inch	45
2½ inch	50
2¾ to 5 inch	57
6 to 13 inch	45

Wire Products.—The first run of the heavy fall business is beginning to appear in the market and the past week has seen a considerable booking attributed to this cause. Prices are firm in all departments and we quote as follows:

Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85; painted barb wire, jobbers' carload lots, $1.80; retailers' carload lots, $1.85.

Coke.—The coke market has not lost very many of the factors which during the past few weeks have maintained a constant flurry, and there is still a very wide difference in contract figures for next year, largely because of the fact that the contract market for 1910 has not been severely tested. It is unofficially reported that one Cleveland furnace covered for the first quarter at $2.45 ovens and another furnace for the first half at $2.35. When the present excitement quiets down and the real business for next year is done, some of the producers who are holding out and refusing to entertain offers at about the figures mentioned, are liable to be left high and dry. There is still talk of $3 coke for next year, but there is nothing in the situation at present upon which to found such expectations. We quote furnace coke for prompt delivery at $2.25 to $2.40 ovens and for the remainder of the year at $2.40 to $2.50. On foundry coke for prompt shipment we quote $2.40 to $2.50 and over the remainder of the year $2.50 to $2.60, at the same time calling attention to the very marked scarcity of labor in the coke regions and to an almost certainty of lower prices when the remaining 40 to 45 per cent of independent operations are able to secure labor and resume work at their plants. A report on the merger which has been under way for the past year is expected within the next day or two. This merger will likely go through on a small scale involving plants already owned by practically one interest, but it is conceded to have failed on the general plans originally outlined. The Connellsville *Courier's* figures for the week ending Sept. 4 show 32,474 ovens active with an output of 421,320 tons, compared with 32,131 active ovens and a production of 416,354 tons the previous week.

Old Material.—The scrap market in the Pittsburg district is extremely active in the minds of dealers who have large stocks on hand, these dealers being busy shifting prices to a greater extent than handling actual sales. Dealers are holding their material at a figure higher than scrap consumers are at present inclined to pay, both sides sparring for time and playing a waiting game. Tonnages moved during the past week indicate, however, an actual advance in nearly every line. Several fairly large tonnages of borings and turnings have been offered to dealers at about $11.50 and $13.50 respectively, but no sales are noted, dealers not being able to see where they can turn a profit at this time when buying at the prices mentioned. We quote gross tons, delivered in the Pittsburg district, as follows:

Heavy melting scrap	$17.00 to 17.50
Rerolling rails	18.00 to 18.50
Bundled sheet scrap	15.50 to 16.00
Iron axles	26.50 to 27.00
Old iron rails	19.00 to 19.50
No. 1 wrought scrap	18.00 to 18.50
Old car wheels	17.00 to 17.50
Low phosphorus	21.00 to 21.50
Machine shop turnings	13.00 to 13.50
Cast borings	10.75 to 11.00
No. 1 cast scrap	16.00 to 16.50
Malleable	16.00 to 16.25
Stove plate	12.00 to 12.50

BUFFALO.

Demand for Pig Iron from Distant Points Stronger than in Local Market.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Sept. 14.

Pig Iron.—No more unusual situation has developed in pig iron in the Buffalo district than is found here at present. With the local furnaces running at about full capacity and prices lower than at many other

points, there is such a weak demand from Buffalo consumers that much of the furnace output is being shipped into other iron centers at higher figures than could be obtained here. Foundry interests are generally reported as running lighter than is the case elsewhere. Considerable Buffalo iron has been moved to New England and much heavy tonnage has been placed for delivery west. Prices certainly are stiffening to some extent and local furnaces are profiting from the inability of furnaces at other points to supply the heavy demand. When last reporting this market it was necessary to advance the price on certain grades. This week we again change some quotations. No. 2 X foundry has advanced from $16 to $16.25 and $16.25 to $16.75. A like advance is found in all the other foundry grades as may be seen in the schedule given below. Inquiry for fair tonnage is heard all along the line. One inquiry for 6,000 tons appeared today from a consumer of No. 2 plain in New York state. Another inquiry from a point west asked for 8,300 tons No. 2 plain at $16.00 with deliveries during remainder of the year. On this tonnage a price of $16.50 was quoted and turned down. A few days ago, one furnace was offered $16.50 at furnace for No. 2 X foundry from a consumer who would have been obliged to pay high freight rate. There is a growing demand for charcoal which comes with the betterment in business conditions and an increase in the foundries working on special grades of castings.

We quote f. o. b. Buffalo for last quarter deliveries as follows:

No. 1X foundry	$16.50 to 17.00
No. 2X foundry	16.25 to 16.75
No. 2 plain	16.00 to 16.25
No. 3 foundry	15.75 to 16.00
Gray forge	15.25 to 15.50
Malleable Bessemer	16.00 to 16.50
Charcoal	19.50 to 20.50

Finished Products. — Specifications on current and structural business are coming out freely, but they do not include any heavy tonnage, although the aggregate tonnage keeps up the strong tone of the finished product market. The mills are falling still further behind, and there is no immediate outlook for them to catch up. One interest stated today that its mills are from five to six months behind on ¾-inch bars and small-sized flats. Domestic and export business is satisfactory. The Carnegie Steel Co., booked 5,000 tons Saturday for delivery in Canadian territory and took considerable business from Ontario at the beginning of this week. Concerns doing fabricating are heavily booked at the present time, but these interests are apprehensive as to the remainder of the year, for unless heavy tonnage comes out in the immediate future, these interests may find little heavy work in their line until there are further developments.

Included in the building projects in which structural steel and ornamental iron will be used are the following:

Bark building, two stories, at Broadway and Fillmore avenue, Buffalo, to be erected for D. H. Coplin Co.; factory and warehouse, five stories, 45 x 110, for Nathan Gutman, 58 Pearl street. This business may now be figured: Convent at Depew, N. Y., a two-story building, for St. Augustine R. C. Church; three story school building, 65 x 101, to cost $45,000, in Kenmore, N. Y., John A. Murphy, president of the school board; printing plant for the J. B. Lyon Co., Albany, N. Y.; apartment building at Rochester for L. Berman interests, 850 Powers building, same city; apartment building, five stories, to cost $40,000, for Charlotte Leonard, 14 Price place, Syracuse; school building at New York Mills, N. Y., to cost $8,000, new bids being received by the school board; state buildings at Iroquois, N. Y., for the Thomas Indian schools.

One of the principal contracts let recently was one for building the three-story addition for the Wm. Hengerer Co., lessee from Buffalo Realty Co., the steel work being let to the Buffalo Structural Steel Co.; oil refinery, four stories, 45 x 85 to cost $25,000, for Spencer Kellogg Co., steel work let to H. C. Harrower Co., of Buffalo; Odd Fellows' Temple, three stories, $40,000, for the Odd Fellows Temple Association, at Syracuse, Russell & King, architects, Syracuse; factory addition for New Products Rawhide Co., of Syracuse, general contract let to Hefferman & Son, same city.

BIRMINGHAM, ALA.

Pig Iron Market in Satisfactory Condition—Production Increasing.

Sept. 13.

The southern pig iron market is improving, both as to demand and as to quotations. There are a number of sales being made, mostly in small lots, and for a period of delivery extending towards the last of the present year and into the first quarter of the coming year. The quotations for pig iron have increased from $13.50 per ton, No. 2 foundry, which was the price at the beginning of the month, to $14 per ton, with $14.25 and $14.50 being asked. It is announced that a few small lots of iron, immediate delivery, have been sold already at the last named prices. The $14.50 per ton quotation will most likely be the prevailing figure by the end of the week, it is believed, if the demand holds up, which seems most probable. The accumulated stocks of iron have been reduced, so far as the iron that belongs to the producers is concerned. The make in this section of the country is being improved. The blowing in of the furnace at North Birmingham belonging to the Sloss-Sheffield Steel & Iron Co., which has been undergoing repairing for some time, will be followed by the blowing in shortly of the third furnace at Thomas, near here, belonging to the Republic Iron & Steel Co., and another furnace belonging to the Tennessee Coal, Iron & Railroad Co. Previous to this, announcement was made that the Southern Iron & Steel Co., successor to the Southern Steel Co., would by the middle of the coming month be ready to start up at least three of its furnaces. This company will need about all the iron it can manufacture for the steel plant at Gadsden, Ala. Other furnaces in this state and in adjoining states are being made ready for operation. Reports that some apprehension is being aroused as to the raw material supply do not appear to prevail in this district.

The Tennessee Coal, Iron & Railroad Co. continues to receive orders for steel rail to be produced at its steel plant at Ensley. The company intends some big things in the Birmingham district, the exact nature of which has not yet been given out.

The following quotations are given for old iron material:

Old iron rails	$16.00 to 16.50
Old iron axles	17.50 to 18.00
Old steel axles	16.50 to 17.00
Old steel rails	11.50 to 12.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	11.50 to 12.00
No. 1 country	8.00 to 8.50
Old standard car wheels	13.00 to 13.50
Stove plate	9.00 to 9.50
Heavy melting steel	11.50 to 12.00
Old steel boiler plate	9.00 to 9.50
No. 1 machinery	11.50 to 12.00
Cast borings	5.50

Owing to further delay in securing the necessary current, the Heroult electric furnace installation of the Steel Corporation at Worcester, Mass., will not be started before Nov. 1. The South Chicago installation is in successful operation.

CHICAGO.

Pig Iron Firm—Gradual Increase of Strength in Finished Lines.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Sept. 14.

All lines of the iron and steel industry seem to be in the same flourishing condition as has been reflected in these reports for several weeks. Another large blast furnace in this district is about to blow in, the billet mill at Gary is doing splendid work, and another producer of bar iron has been added to the list of local interests in that line. There has been a gradual increase in strength in the market for finished and semi-finished material, which at last has taken form in some advances in prices, as will be noted from the quotations in a number of lines, given below. Railroads continue to order cars, as well as material necessary for equipment and maintenance, in large quantities. One of the largest car inquiries in the past few days was from the Lehigh Valley, which is said to be in the market for 3,000 freight cars.

Pig Iron.—While no further advance has been made in prices, the market is fully as strong this week as last. There has been some buying and quite a little inquiry, the latter in part for low grade irons to take the place of the high-priced scrap iron. Local production probably will be increased by the product of the Iroquois Iron Co.'s "B" furnace, which is filled and ready for the torch to be applied. The stack probably will be in blast by the time this report is in print. It is reported that a new charcoal blast furnace will be erected at Bay City, Mich., early next year, by hardware and other local Michigan interests. The projectors are said to have secured the wood privileges on 100,000 acres of land, and will manufacture by-products as well as the charcoal for the furnace. Reports from the south are to the effect that the furnaces are well sold up for this year and the first quarter of next. Some re-sale iron has moved in the south, in odd lots, here and there, and it is believed that the most of this speculative iron has been disposed of.

Northern foundry No. 2	18.00 to 18.50
Northern foundry No. 3	17.50 to 18.00
Southern foundry No. 1	18.35 to 18.85
Southern foundry No. 2	17.85 to 18.35
Southern foundry No. 3	17.10 to 17.60
Southern foundry No. 4	16.60 to 17.10
Southern No. 1 soft	18.35 to 18.85
Southern No. 2 soft	17.85 to 18.35
Southern silveries, 4 per cent silicon	18.35 to 18.85
Southern silveries, 5 per cent silicon	18.85 to 19.35
Southern silveries, 6 per cent silicon	19.85 to 20.85
Jackson Co. silveries, 6 per cent.	20.40
Jackson Co. silveries, 8 per cent.	21.40
Jackson Co. silveries, 10 per cent	22.40
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.00 to 19.50
Alabama basic	18.35 to 18.85

Billets.—Conditions in this line remain the same as have been reported for some time, there being no billets for sale in this territory.

Merchant Bars.—There is much activity in this line, the volume of business being very satisfactory, while prices show the effect of the gradual hardening in all lines, and both mill and store quotations are higher this week. The Plue Island Car & Equipment Co. has been running its bar mill regularly since Friday, on one furnace, and will light the other furnace, tomorrow (Wednesday).

We quote for Chicago delivery, as follows:

Bar iron, 1.45c to 1.50c; hard steel, 1.45c to 1.50c; soft steel bars and bands, 1.58c to 1.63c, half extras, soft steel angles, less than 3 x 3, 1.63c to 1.68c, half extras; hoops, 1.63c to 1.68c base, full extras; planished or smooth finished tire steel, 1.63c to 1.68c; iron finish, up to 1½ x ½ inch, 1.63c base, tire card; iron finish, 1½ x ½-inch and larger, 1.43c to 1.48c base, steel card; channel for solid rubber tires, ¾ to 1 inch, 1.93c to 1.98c; and 1⅛ inch and larger, 1.83c to 1.88c; smooth finished machinery steel, 1.73c; flat sleigh shoe, 1.53c; toe calk steel, 2.03c; spring steel, 2.08c; crucible spring steel, 2.58c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 60 per cent off the list for carload lots, and 55 per cent off for less than carload lots, carload freight allowed to points in base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 1.80c, base, full extras; soft steel bars, 1.80c to 1.90c per 100 pounds base, plus half extras; soft steel hoops, 2.25c, full extras.

Structural Material.—The inquiry for structurals in small lots is very large, and although the amount of actual business is not so heavy as it was for a few weeks, it is quite satisfactory, as there is not much, if any, relief from the congestion which has been a very troubling feature in this market for weeks. The contract for the 5,000 tons of steel for the Sherman House was let this week, the Morava Construction Co. being the successful bidder. The American Bridge Co. secured the contract for a bascule bridge, to be erected by the Chicago & Western Indiana Railroad, near Hammond, Ind., and requiring 1,000 tons of steel. The same interest will furnish the steel for the Children's Hospital, at San Francisco, amounting to 436 tons. The Steel Corporation has definitely decided upon the building of another ore dock at the head of the lakes, this fall and winter, which will require 10,000 tons of steel, and be practically a duplicate of the one previously built at Two Harbors by that interest. It will be located either at Duluth or Two Harbors. Prices show some advance, this week.

We quote mill prices for structural shapes, Chicago delivery, as follows:

Beams and channels, 15-inch and under, 1.68c to 1.73c. For extras see Pittsburg report.

Local store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $1.90 per 100 pounds; angles over 6 inches, $2.00 per 100 pounds base; beams, 3 to 15 inches, inclusive, $1.90 per 100 pounds base; channels, 3 inches and larger, $1.90 per 100 pounds base.

Rails and Track Supplies.—A very heavy business continues to be the rule in this market. Sales of standard section rails by the leading interest, for the week amounted to 60,000 tons, of which 35,000 tons were open-hearth and the balance, Bessemer. The specified delivery is through the winter months and next year. The local mills are filled up with orders for the remainder of this year, including the light rail mills at South Chicago, which are running on 60-pound rails. Light rail sales are heavy. Sales of track fastenings by the leading interest during the past week were equal to a month's capacity of its mills.

See Pittsburg report for prices on standard sections. On light rails, Chicago delivery, we quote as follows:

Light rails, 40 and 45-pound, $26; 30 and 35-pound, $26.75; 16, 20 and 25-pound, $27; 12-pound, $28. In lots of 250 to 500 tons a reduction of 60 cents a ton from these prices is made; lots of 500 tons and up carry a reduction of $1 a ton. Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.75c to 1.85c; smaller size spikes, 1.85c to 1.95c base; track bolts, with square nuts, 2.25c to 2.35c; with hexagon nuts, 2.40c to 2.50c.

Plates.—There is a very good business being booked for plates, car companies and bridge shops being especially heavy in their requisitions, and prices are showing the effect of the large demand.

We quote, for Chicago delivery, as follows:

Tank plates, ¼-inch thick; 6¼ to 100 inches, 1.68c to 1.73c. For extras see Pittsburg report. Store quotations are without change, as follows:

Tank steel, ¼-inch and heavier up to 72 inches wide, 1.90c to 2.00c; from 72 inches wide to 96 inches wide, 2.00c to 2.10c; 3/16-inch up to and including 60 inches wide, 2.00c to 2.10c; 72 inches, 2.25c to 2.35c; No. 8 up to 60 inches wide, 2.05c to 2.15c. Flange and head quality, 25c extra.

Sheets.—The conditions in this market offer little excuse for extended comment. Business is very good, as it has been for some time, and the one interest producing sheets in this territory—the Inland Steel Co.—is sold up for the remainder of the year. Prices are being maintained firmly, but no advance is reported.

For mill prices see Pittsburg report. Freight to Chicago, 18 cents. We quote store prices at Chicago as follows:

No. 10, 2.20c to 2.30c; No. 12, 2.15c to 2.25c; No. 14, 2.20c to 2.30c; No. 16, 2.30c to 2.40c; Nos. 18-20, 2.50c to 2.60c; Nos. 22-24, 2.55c to 2.65c; No. 26, 2.60c to 2.70c; No. 27, 2.65c to 2.75c; No. 28, 2.75c to 2.85c; No. 30, 3.05c; galvanized sheets, Nos. 10 to 16, 2.90c to 3c; Nos. 18 and 20, 3.05c to 3.15c; Nos. 22 to 24, 3.20c to 3.30c; No. 26, 3.40c to 3.50c; No. 27, 3.60c to 3.70c; No. 28, 3.80c to 3.90c; No. 30, 4.20c to 4.30c.

Wire Products.—A larger business has been booked in the past week or ten days than for quite a while previously, trade in fence wire being the best of all the lines. In barb wire, the conditions are satisfactory, except in the south, where it is a little disappointing. We quote, Chicago delivery, as follows:

Wire nails, jobbers' car lots, $1.98; retailers' carload lots, $2.03; retailers, less than carload lots, $2.13; painted barb wire, jobbers' carload lots, $1.98; retailers, carload lots, $2.03, with 30c for galvanizing; plain wire to jobbers, carload lots, $1.78; staples, $1.98.

Merchant Pipe and Tubes.—This has been a quiet week in market for pipe and tubes. Business is of a routine character and prices as yet show no change from former discounts. We quote, for lap-welded tubes, out of store, 65 off, and for charcoal, 50 off. For mill discounts, see Pittsburg report.

Cast Iron Pipe.—The bulk of the orders being received by makers of cast iron pipe is in small lots of from 100 to 200 tons. No change in prices has as yet been made. We quote as follows:

Four-inch water pipe, $27.50; 6 to 14 inches, $26.50; larger sizes, $25.50; gas pipe, $1 a ton higher.

Old Materials.—Reports of a continued strong condition are made from this market, this week. There seems to be considerable stuff moving, and prices are being maintained, and, in some instances, are higher. We quote as follows:

Old car wheels	$18.50 to 19.00
Old iron rails	19.00 to 19.50
Rerolling rails (4 ft. and over)	17.50 to 18.00
Old steel rails (2 ft. and under)	16.25 to 16.75
Light section relayers, 45 lbs. and under subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	22.50 to 23.50
Frogs, switches and guards	16.00 to 16.50
Heavy melting steel	16.00 to 16.50
Shoveling steel	15.25 to 15.75

We quote, net tons, as follows:

No. 1 R. R. wrought	$15.50 to 16.00
No. 2 R. R. wrought	14.25 to 14.75
Arch bars and transoms	17.75 to 18.00
Knuckles, couplers and springs	14.75 to 15.25
Shafting	16.50 to 17.00
Iron car axles	20.50 to 20.75
Steel car axles	19.00 to 19.25
Locomotive tires	15.50 to 15.75
Dealers' forge	12.50 to 13.00
Pipes and flues	11.50 to 12.00
No. 1 cast, 150 lbs. and less	14.75 to 15.25
No. 1 busheling	12.50 to 13.00
No. 2 busheling	9.00 to 9.25
No. 1 boiler cut	11.25 to 11.75
Boiler punchings	14.00 to 14.50
Cast and mixed borings	7.00 to 7.50
Machine shop turnings	9.25 to 9.75
Railroad malleable	14.75 to 15.25
Agricultural malleable	13.00 to 13.50
Stove plate and light cast scrap	12.50 to 13.00
Angle bars, splices, etc. (iron)	17.50 to 18.00

PHILADELPHIA.

Increased Interest in Pig Iron Imports—Scrap Prices Advancing.

Sept. 14.

Pig Iron.—Although as yet no purchases of foreign iron for importation have been reported, the situation in this respect is attracting increased interest throughout this immediate district, which is likely to be the first importation point in case such a movement does develop. At present the level of American irons at seaboard points and of British irons laid down at seaboard, duty paid, is practically the same. It is only the matter of an adequate profit which is keeping out foreign iron, but this means a considerable item to be commensurate with interest charges and rejection and other risks involved. With this possibility to face, however, pig iron producers are not anxious for a continuance of the sharp advances which have been the rule during the late summer; in fact, certain interests are openly endeavoring to hold prices at about the current level, and quotations show no material change from those reported a week ago, although there is a steady elimination of the lowest offerings and prices show less irregularity. During the week, we note the sale of several blocks of basic iron for advanced delivery, principally for the second quarter, at $18, delivered, which evidently is still the ruling figure, although two large producers are holding at $18.50. Virginia basic is firm at $16, furnace, which keeps it out of this market, as is also the case with western Pennsylvania product. A considerable tonnage is under negotiation for forward delivery and the call for prompt metal is still insistent. Foundry operations are showing a steady increase, which is resulting in a good many moderate sales, the range for No. 2X being from $17.25 to $17.75, furnace, for the remainder of this year, with $18.25 the ruling figure for first half. Some important tonnages have been placed on the latter basis. The Warwick Iron Co. is putting in a large merchant furnace this week and the Pennsylvania Steel Co. has just blown in another Lebanon stack. A meeting of the Eastern Pig Iron Association will be held tomorrow and will probably show further decreases in stocks. Pipe irons are still in active demand. We note an inquiry for 15,000 tons, in three grades of 5,000 tons each. Sales of the week include one block of 5,000 tons of Virginia foundry iron and 1,000 tons of low phosphorus iron made from local ores, besides a lot of about 1,000 tons of northern car wheel iron. We quote, eastern Pennsylvania delivery, over the remainder of the year, as follows:

No. 1X foundry	$18.50 to 19.00
No. 2 X foundry	18.00 to 18.50
No. 2 plain	17.50 to 18.00
Standard gray forge	16.75 to 17.25
Basic	18.00 to 18.50
Low phosphorus	20.50 to 21.00
No. 2 Birmingham	17.50 to 18.00
No. 2X Virginia	18.00 to 18.50
No. 2 plain Virginia	17.50 to 18.00

Coke.—Sales of 15,000 tons of furnace coke are reported by one interest and the market is firm on a basis of $2.50, ovens. Several large furnaces have not covered any important part of their 1910 requirements, though the outlook is for higher prices with a car shortage nearer by 100,000 cars than a month ago. Foundry coke is selling on a basis of $2.65, ovens, freight from the Connellsville district being $2.35.

Finished Material. — This district will benefit materially through the official awards, just announced, to the Cramp and the New York ship building companies, of contracts for constructing the two 26,000-ton battleships. The finished material market is considerably stronger and practically all producers are now on a 1.45c basis, with several interests securing $1 per ton higher on small lots. Contracts are still being accepted only up to Oct. 1, but local mills are so far behind in shipments that this really means delivery to Dec. 1. One of the larger sellers of structural steel is now insisting that fabricating shops specify the particular job for which each tonnage is delivered. The Reading will shortly put out plans for its Port Richmond track elevation work and an office building, involving a large

tonnage. The Lehigh Valley has distributed orders for several small bridges among the Pennsylvania Steel Co., Lewis Shoemaker & Co., and others. The Bay View hotel, at Baltimore 250 tons, went to Dietrich Bros. and the Cherry River Paper Co. has inquiries out for a moderate tonnage of mill work. Dietrich Bros. has also taken an order for 250 tons for a Baltimore hospital. The city of Philadelphia is today taking bids on two bridges, involving about 900 tons of steel. Official announcement is made that the Baltimore & Ohio has given an order for 26 locomotives to the Baldwin works, and for 34 to the American Locomotive Co. A brisk demand is noted for charcoal iron boiler tubes, one maker in this district being booked up for the next four months and prices are better than before the depression, extra discounts having been discontinued. We quote: Structural plates and shapes, 1.60c to 1.65c; sheets, No. 28, 2.80c; steel bars, 1.55c to 1.60c; refined bar iron, 1.50c to 1.55c.

Old Materials.—There has been a sharp advance in practically all lines of scrap and large tonnages of heavy melting steel have been sold all the way from $17.50 to $18, delivered. The joint buying arrangement is understood to have secured practically all the scrap of this character in the railway lists this month, and is again comfortably supplied. This advance has had the effect of bringing out several good blocks of steel which have been held over a long period, and consumers hope the present level will not experience further change in the early future. Considerable steamship tonnage has recently been chartered for the purpose of bringing scrap iron cargoes to this port from New Orleans. We quote, gross tons, eastern Pennsylvania delivery, as follows:

Old steel rails (rerolling)	$18.25 to 18.75
No. 1 steel scrap	17.50 to 18.00
Old steel axles	23.00 to 24.00
Old iron axles	26.00 to 27.00
Old iron rails	20.00 to 21.00
Old car wheels	17.00 to 17.50
Choice scrap R. R. No. 1 wrought.	20.00 to 20.50
No. 1 yard scrap	18.50 to 19.00
Machinery scrap	16.00 to 16.50
Low phosphorus scrap	20.50 to 21.00
Wrought iron pipe	17.00 to 17.50
No. 1 forge fire scrap	16.00 to 16.50
No. 2 forge fire scrap, ordinary.	9.50 to 10.00
Wrought turnings	14.50 to 15.00
Axle turnings, heavy	15.50 to 16.00
Cast borings	12.00 to 12.50
Stove plate	14.00 to 14.50

CLEVELAND.

Mills Slow to Make Contracts—Heavy Inquiry for Ship Material.

Office of THE IRON TRADE REVIEW.
Browning Building, Sept. 14.

Iron Ore.—The business of the agencies of mining companies now consists largely of taking care of small orders, which in the aggregate make a very comfortable tonnage. The movement of ore from upper lake ports is very heavy and promises to amount to 7,000,000 tons for the month, if that tonnage can be handled at lower lake ports.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.00; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—Many inquiries for basic are being received, but furnaces are conservative about making quotations. The new stack of the Cleveland Furnace Co. will be blown in tomorrow and will be run on basic and malleable. The demand for foundry grades is not so brisk as it was recently, but the market is firm. For No. 2 foundry, Cleveland furnaces are quoting from $16.75 to $17.25 delivered in the city for prompt iron, and $17.00 furnace, for the first half of next year. For prompt shipment we quote, delivered in Cleveland, as follows:

No. 1 foundry	$17.25 to 17.50
No. 2 foundry	16.75 to 17.25
No. 3 foundry	16.50 to 17.00
No. 2 southern	17.85
Gray forge	15.25 to 15.50
Bessemer	17.90
Lake Superior charcoal	19.50 to 20.00
Jackson Co. 8 per cent silvery	20.05

Coke.—A large number of companies are unwilling to make quotations for the first half of next year on furnace coke, or to make contracts except on a basis of 7 to 1, the price of basic pig iron being used. Some sales of furnace coke for the remainder of the year have been made as high as $2.40. On furnace coke for the first half, $2.50 is the minimum. On foundry coke, quotations for the first half range from $2.65 to $3.00.

Finished Materials.—The leading interest is notifying customers that contracts requiring that specifications must be in equal amounts for the remaining months of the period of contract, will be rigidly enforced. This interest is very slow to make any kind of a contract at the present time. Some of the independent companies are making contracts to the first of April, and in a few cases to best customers up to July 1. Ship building companies are in the market for 16,000 tons of plates and shapes. A considerable part of this tonnage is for delivery during November, December and January, and the ship building companies are having trouble in making contracts for that period. A number of engineering companies are figuring on 1,000 to 1,200 tons of structural material for the buildings of the new steel plant of the Upson Nut Co., for which it is expected contracts will be awarded Oct. 1. The Interstate Engineering Co. has taken a contract for four Erie Canal bridges which will require 400 tons of shapes. The same company is in the market for 1,200 tons of structural material for additions being erected by the Jeffrey Mfg. Co., Columbus, O. The new addition of the Best Foundry Co., at Bedford, O., will require 200 tons of steel. We note an inquiry for 3,000 tons of axle billets. Jobbers are now quoting, out of stock, 1.80c on bars and 2c on structural material.

Old Material.—Conditions remain practically the same in the local scrap market. Consumers are apparently waiting for a decline in prices, which seems improbable in view of the present strength of the market. On the part of brokers and dealers, the feeling is that prices have not reached the high-water mark as yet, although quotations remain about the same as last week. We continue to quote, f. o. b. Cleveland, as follows:

Old iron rails	$18.50 to 19.00
Old steel rails (re-rolling)	16.50 to 17.00
Old steel rails (under 6 feet)	16.50 to 17.00
Old car wheels	15.50 to 16.00
Old steel boiler plate	14.00 to 14.50
Malleable iron (railroad)	16.00 to 16.50
Steel axles	19.00 to 19.50
Malleable iron (agricultural)	14.00 to 14.50
Heavy steel	15.50 to 16.00
Country mixed steel	14.00 to 14.50
Low phosphorus	18.50 to 19.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$15.00 to 15.50
No. 1 busheling	14.00 to 14.50
No. 1 machine cast	14.00 to 14.50
Iron axles	20.00 to 21.00
Axle turnings	11.50 to 12.00
Machine shop turnings	10.00 to 10.50
Grate bars	12.00 to 12.50
Pipes and flues	12.50 to 13.00
Tank iron	11.50 to 12.00
Hoop and band iron	9.50 to 10.00
Sheet iron	8.00 to 8.50
Wrought drilling	10.00 to 10.50
Stove plate	11.50 to 12.00
Cast borings	8.00 to 8.50

ST. LOUIS.

Pig Iron Prices Higher—Coke Market Continues Strong.

Sept. 13.

Pig Iron.—It is generally conceded that $14 is the minimum for St. Louis territory and some dealers insist that $14.50 is nearer the correct figure. The demand for iron in this market is good. Specifications are coming in on contracts, and in some instances are accompanied by requests to anticipate shipments. Inquiries are remarkably good, and several large tonnages probably will be closed before the week ends. Malleable Bessemer is firm at $16.25 to $16.50, Ironton, and some Ohio foundry was sold within the last few days at from

$16.50 to $17, furnaces. Orders for iron are being booked and offers received on a basis of $14 for prompt shipment while $14.50 is asked for last quarter shipment.

Two of the largest furnaces in the Birmingham district have refused to quote prices on inquiries aggregating several thousand tons for shipment over the first three months of 1910. It is estimated that from 4,000 to 6,000 tons, mostly malleable iron, was sold in the St. Louis territory last week, including 1,000 tons of car wheel iron, which brought $16.50, f. o. b. the furnace.

Our prices delivered, to which the freight of $3.75 from Birmingham has been added, follows:

No. 1 southern	$18.25 to 18.75
No. 2 southern	17.75 to 18.25
No. 3 southern	17.25 to 17.75
No. 4 southern	16.75 to 17.25

Coke.—The market for coke continues strong. One order was booked last week for 100 cars of Connellsville foundry for shipment during the first half of 1910 at $2.50, ovens. Since then, smaller quantities have been sold at from $2.75 to $3 for the same delivery, while as high as $3.25 has been asked. Connellsville foundry coke for prompt shipment commands a price of $2.50 to $2.75 a ton, and furnace coke about the same price on contracts. Stonega coke is up to $2.50 for the first half of 1910, and is bringing $2.35 for delivery over the remainder of the present year. By-product coke is firm at $5.25, St. Louis, for all deliveries, and the market is reported to be strong.

The freight on Connellsville and Virginia coke is $2.80 to East St. Louis and St. Louis, and $2.70 from the Virginia fields, when shipment is destined beyond St. Louis.

Old Materials.—Our quotations on scrap iron are as follows:

Cast iron borings, free from foreign material, net tons	$ 5.50 to 6.25
Steel axle turnings, gross tons	11.00 to 12.00
Steel railroad axles, net tons	18.00 to 19.00
Iron railroad axles, net tons	20.00 to 21.00
Miscellaneous steel scrap, gross tons	11.00 to 12.00
Old car wheels, gross tons	15.50 to 16.50
No. 1 railroad cast scrap, net tons	12.50 to 13.50
Heavy machinery cast, net tons	14.00 to 14.25
Stove plate and light cast, net tons	10.00 to 11.00
Sheet iron, net tons, uncut	5.00 to 5.50
No. 1 railroad wrought, net tons	13.00 to 13.50
Railroad malleable net tons	13.00 to 13.50
Heavy melting steel, net tons	12.00 to 13.00
Relaying rails, net tons	18.00 to 19.00
Extra heavy cast, regular breaking	12.00 to 13.00
Railroad grate bars (eng)	10.50 to 11.00

No Interruption.—The S. Obermayer Co. announces that the fire in the Cincinnati plant Sept. 11 did no damage except to the warehouse and that there will be no interruption to the business of the concern.

NEW YORK.

Trans-Atlantic Freight Rates Advancing—Good Outlook for Structural Contracts.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Sept. 14.

Iron Ore.—The possibility of the continued advance of trans-Atlantic freights is beginning to claim attention on the part of those interested in European ore supplies. Within the immediate past there has been an advance of fully 2 shillings and one recent charter for the Spanish trade was at 10 shillings. Foreign ores are also higher, Bilbao Rubio, the European basing ore, having advanced in two weeks from 16 shillings, 3 pence to 18 shillings. There is a scarcity of Spanish low phosphorus ore.

Pig Iron.—Locally the iron market is somewhat more quiet than for some weeks past, this being explained by the fact that most of the largest consumers have covered as far ahead as they desire at present and the tonnage being placed by the more modest buyers does not reach so large an aggregate. There is still a good scattering of orders ranging from 1,000 tons downward, with now and then one of larger size, and a surprising development is the brisk buying for early delivery by interests supposed to have bought up to their full requirements through the year. Buffalo furnaces, shipping by water, are still supplying Sound ports to the exclusion of other producers and all through New England Buffalo irons are selling most actively, the usual basis for prompt or last quarter being $16, furnace. One 3,000-ton inquiry is pending in the immediate New York territory. We quote, delivery over the remainder of the year at New York tidewater, as follows:

Northern foundry No. 1	$18.25 to 18.75
No. 2X foundry	17.75 to 18.25
No. 2 plain	17.25 to 17.75
No. 2 southern foundry	17.50 to 18.00
Malleable	18.00 to 18.50
Gray forge	16.75 to 17.25

Ferro-Alloys.—There has been considerable selling of 50 per cent ferrosilicon during the past week, one eastern steel plant having covered its requirements up to July 1, next, reported at about 500 tons, at under a $62.50, Pittsburg, basis, and another sale of 150 tons for next year having been made at this figure. A sale of 450 tons of prompt ferro-manganese is reported at a shade under $42, at which price some other selling has been done. We note miscellaneous orders placed during the week to the extent of about 150 tons. For advanced shipment prices show no change from those previously reported, one sale of 300 tons for westward delivery next year being closed Tuesday at $44, seaboard.

Cast Iron Pipe.—While most interests are asking an advance commensurate with the recent increase in iron prices, some low quotations are still being made. Two New York City lettings on Wednesday are of interest as giving a line on the current level. Both are contractors' lettings for Manhattan and the Bronx, one calling for 1,340 tons of 6 and 12-inch, with 100 tons of specials, and the other 1,700 tons of the same sizes with 110 tons of specials. Lodi, N. J., will buy 600 tons of 4 to 18-inch on Sept. 20, and Skillman, N. J., is in the market for a smaller tonnage. The Standard Cast Iron Pipe & Foundry Co. secured a contract for 3,000 tons of 24-inch at Philadelphia during the past week, and the United States Cast Iron Pipe & Foundry Co. took a lot of 200 tons at Rochester.

Finished Materials.—Looking beyond the immediate future, the structural materials situation is bright. Railroad interests are buying very little at present, but intimate that about the end of this year or early in 1910 they will have an extremely large volume of work to place. Their statements are borne out by the fact that their drafting rooms are busy and additional draftsmen are in keen demand. Locally, the subway situation promises the most important developments within the next few months, as it is known that detailed working drawings are being prepared for very extensive improvements and extensions. It would not be surprising if the coming year should bring out fully 200,000 tons of work from this source in New York City.

Just at present the structural market is quiet and is likely to continue so for a considerable time. Mills are sold up to such an extent that deliveries run all the way from two to six months, and with this delay in prospect, no large propositions are expected in the trade. Fabricating shops are turning out their maximum tonnage under present conditions. Last month the American Bridge Co., with a rated capacity of 60,000 tons, shipped about 43,000 tons, and the outturn the current month will be somewhat larger in spite of lack of steel and delays in securing drawings. So far as new orders are concerned, the present constitutes a sort of breathing spell.

The Eastern Steel Co. has taken contracts for 2,000 tons of steel required for a garage on Fifty-fourth street and about 450 tons for a pier shed in Haiti, and the American

Bridge Co. will furnish 500 tons for bridge work on the Norfolk & Western, but these constitute all the local lettings of importance. Outside of this city, the Boston Bridge Works have taken the highway bridge at Rumford, Me., 650 tons; the McClintic-Marshall Construction Co. has secured 450 tons for the bridge requirements of the Franklin & Fairfield, the Buffalo Structural Steel Co. will supply 450 tons for an addition to the Buffalo Realty Co. building; in the same city a local fabricator, H. C. Harrower, took the Granger warehouse, 550 tons, and an independent interest secured 1,200 tons of steel work for the pumping station; the Brown-Ketcham Iron Works were given the municipal courthouse at St. Louis, 1,250 tons; and the Massillon Bridge & Structural Co. secured 1,300 tons for the Pennsylvania lines west. The steel contract for the Sherman house in Chicago, 5,000 tons, was divided between the South Halstead Street Iron Works and the Morava Construction Co. Bids go in at an early date on a 1,900-ton warehouse at Lowell, Mass.

We note an inquiry for 16,000 tons of standard rails, but otherwise no important railway orders are in prospect. Billets are so scarce that no selling is reported. A general upward tendency is noted in structural materials and plates, but the minimum quotations given below can still be secured.

Angles, 3 to 6 inches x ¼-inch and heavier, 1.56c to 1.61c; beams, 3 to 15 inches, 1.56c to 1.61c; tees, 3 x ¼-inch and heavier, 1.56c to 1.61c; plates, carloads, tank, 1.56c to 1.61c; marine boiler, 1.86c; bar iron, 1.55c; soft steel bars, 1.56c; sheets, No. 28, black, 2.56c.

Old Materials.—Reports from the eastern Pennsylvania district indicate that there has been a sharp advance in heavy melting steel, with sales of round tonnages at the top figures quoted. The local market shows advances in railroad wrought, track scrap and wrought turnings, but the volume of current business is light. We note the recent arrival at this port of an 1,100-ton cargo of cut pipe from San Francisco, which was sold for heavy melting steel at about $15.25. There is some interest in the Panama scrap now offering and one local house has a representative at the isthmus inspecting it. We quote, gross tons, New York delivery, as follows, these being the prices which dealers are willing to pay:

Old steel rails (rerolling)	$15.00 to 15.50
Relaying rails	19.00 to 19.50
Old car wheels	14.50 to 15.00
Old iron car axles	22.00 to 23.00
Old steel car axles	20.00 to 20.50
Heavy melting steel	14.50 to 15.00
No. 1 railroad wrought	17.00 to 17.50
Iron track scrap	15.00 to 15.50
Wrought pipe	14.00 to 14.50
Cast borings	9.50 to 10.00
Wrought turnings	11.50 to 12.00
Heavy cast scrap	13.00 to 13.50
Railroad malleable	13.00 to 13.50
Stove plate	11.50 to 12.00
Grate bars	11.00 to 11.50

BRITISH IRON AND STEEL.

Decided Improvement Shown—Heavy American Demand Hoped For.

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, England, Sept. 4.

After somewhat long delay, the British pig iron market now seems to be set on catching up with America. In pig iron this has been much the most cheerful week yet experienced since the trade recovery. In the Birmingham district, there has been an advance of 5s per ton for cold blast pig iron, bringing the price up to 115s ($28.16) a ton, and all-mine pig, too, is similarly advanced, making this figure 85s ($20.80) per ton. Practically all classes of pig iron have gone up slightly, and in the Cleveland district, the improvement is very marked, today's figure being 51s 7½d ($12.63), which is the highest since a year ago, and 5s 8d above the minimum of the present year. In Middlesbrough, a boom seems to have set in, and the market is becoming excited; but this is partly due to the operations of speculators among the outside public, who have begun once more to dabble in warrants. A good deal of reliance is placed upon the marked increase during August in our exports, and there are many inquiries from the United States. During the last boom, the American orders increased market values by some shillings per ton. The shipments during August reached 115,684 tons, which was better than the average August of the past ten years by 11,183 tons, or 10½ per cent. The improvement is the more significant because August is usually a very quiet month. At the same time, this is 22 per cent below the best August, that of 1907, and 35 per cent below the record month of April, 1907. The unsatisfactory feature of the market is the constant addition to stocks, which totalled during August 29,331 tons, bringing the amount in store to 290,217 tons. Of course, any extensive American buying would quickly make inroads into a stock which, for the beginning of a revival, is comparatively small. There is a growing belief here that a considerable buying movement in the United States is pending, the argument among experts being that while the New York quotation for American iron is 73s ($17.86) a ton, Cleveland iron can be landed for under 72s ($17.62), and some even say for 69s ($16.88), including duty. The situation is being watched very keenly, and important business developments are anticpated. A peculiar feature is that Germany is not buying well, and has been surpassed even by Italy and North America. The total exports to Germany last month were 11,207 tons, whereas Italy took 15,488 tons and Canada 12,445 tons. France, Belgium and Japan are also buying better than last year. A remarkable development is an important extension of business with Wales, the principality taking 46,000 tons during the last eight months.

Finished Material.—For the first time since the improvement set in, we have had this week a batch of advances in finished materials. Unmarked iron is notoriously difficult to move, but several Midland manufacturers have sent out circulars announcing an advance of 5s per ton. The general effect of this has been to reaffirm the standard of £6-5, although here and there iron can be bought at half-a-crown below this rate. Other classes of finished iron are generally firmer, and, in particular, the makers of gas strip are better engaged than for some time past. There are better demands also for wire and black sheets are quite five shillings dearer in actual sales than they have been. The market is improving in respect of galvanized sheets, this department rapidly overcoming the demoralizing effect of the Association downfall. The lowest figure is now £10-15, but a good deal of business is passing at 5s to 10s above this rate. The tone has been strengthened somewhat by a rise in spelter, and orders are coming in better from abroad. The last-named circumstance is responsible for a strong effort to raise the price of galvanized hollow-ware, buckets in particular, which for some time have been unremunerative.

Structural steel is showing a marked improvement, angles having been advanced 5s per ton, making the new figure £5-15 to £5-17-6d. A similar increase was made in plates and channels, though to this rule there are exceptions. Increasing strength is notable in the market for semi-raw materials, makers of billets being very well off for work with quotations from £4-15 to £4-17-6d.

METAL MARKETS.

ST. LOUIS.

Sept. 13.

Lead and Zinc.—Much of the zinc ore sold in the Missouri-Kansas-Oklahoma district last week was disposed on a $48 and $49 base, with $52 a ton being the highest price reported on an assay base of $49 a ton for 60 per cent grades. Offerings grew less active toward the close of the week.

The sales of zinc ore were fairly heavy and the values were good, but lead ore slumped so decidedly that the total valuation of ores dropped to $283,220. This makes the total for the year $9,747,445, and at this rate the valuation will hardly reach the total of $15,000,000 reported for 1907.

The buying was distributed over the entire district last week and there was no rush to any particular locality. The prospects are good for stronger zinc ore prices this week, as St. Louis spelter on Saturday was quoted at $5.60, with large sales.

The best price obtained for calamine was $25 for 40 per cent grades. Sales were heavy.

Lead ore weakened. One company paid as high as $57 a ton for choice grades, but the prevailing price was $56 a ton. Many new mines are being developed and there is much prospect work going on in the district.

NEW YORK.

Sept. 14.

Copper.—Despite the important increase in stocks shown by the last report of the Copper Producers' Association, the market has held its own and prices are about the same as reported a week ago—Lake, 13¼c to 13½c; electrolytic, 13c to 13¼c, and casting, 12⅞c to 13. Exports for the month to date have shown a heavy decrease. Producers claim that consumption is now no heavier than production, but the most they are attempting is to hold prices at the present level.

Pig Tin.—Domestic consumers have been extremely light buyers of late, and under the influence of this condition prices have weakened slightly. The current range is from 30c to 30¼c.

Pig Lead.—Further re-selling has resulted in a steady lowering of prices and current business is now going at about 4.30c. Consumers do not appear interested in the market.

Spelter.—Only light selling is reported, the present level being in the neighborhood of 5.65c, New York.

Antimony.—We quote Cookson's at 8⅝c to 8¾c; U. S. at 8c to 8¼c, and outside brands at 7¾ to 8c. Some improvement in demand is noted.

CHICAGO.

Sept. 14.

Lake copper, carload lots, 13⅝c to 13¾c; casting copper, 13¼c; smaller lots, ¼c to ¾c higher. Spelter, 5.80c to 5.85c; lead, desilverized, 4.40c to 4.45c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $7.50 list f. o. b. LaSalle in car lots of 600-pound casks; pig tin, 31¾c to 32¼c; Cookson's antimony, 10½c; other grades, 9¾c to 10¼c.

Old Metals.—Weakness has characterized this market for some little time, and business has been of small volume. Prices on old copper and brass have been shaded a quarter of a cent. We quote dealers' selling prices, as follows:

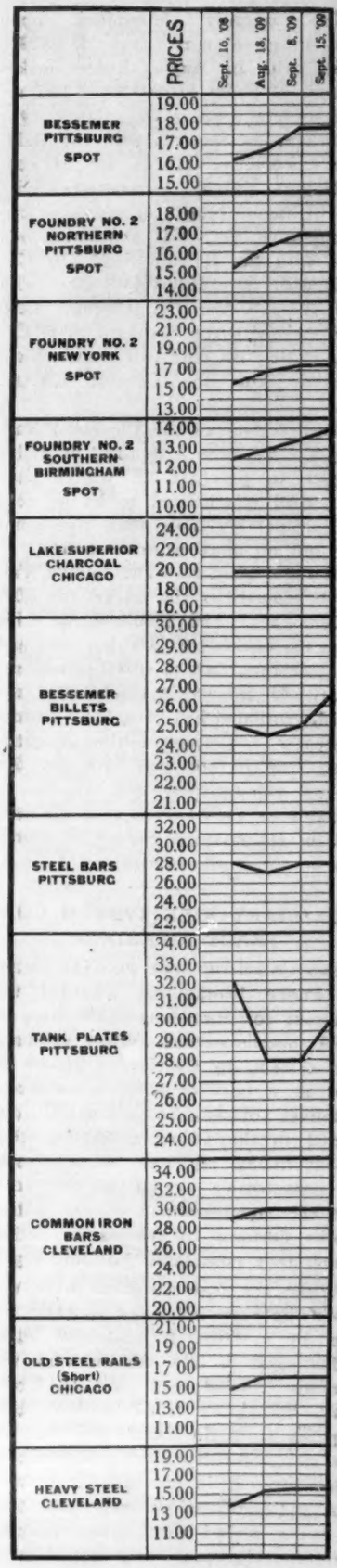
Copper wire, 13c; heavy copper, 12¾c; light copper, 11¼c; heavy red brass, 11¾c; heavy yellow brass, 9¼c; light brass, 6½c; No. 1 red brass borings, 9¾c; No. 1 yellow brass borings, 7½c; brass clippings, 9¼c; tea lead, 3.60c; lead scrap, 4c; zinc, 4½c; tin pipe, 29c; tin foil, 27c; pewter, 20c; electrotype plates, free from wood, 4¼c; electrotype dross, 2.75c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $70 per ton.

WILL MEET IN NEW YORK.

The International Society for Testing Materials concluded its session at Copenhagen, Sept. 11. It has been decided to hold the next meeting in New York in 1912. Chas. B. Dudley, of Altoona, Pa., president of the American Society for Testing Materials, has been elected president of the International Society. Dr. Richard Moldenke attended the meetings at Copenhagen, and a report of the proceedings, written by him, will be published in the weekly edition of THE IRON TRADE REVIEW.

The Niagara Machine & Tool Works, Buffalo, N. Y., has just concluded the purchase of seven acres adjoining the New York Central belt line in Buffalo, where the company proposes to erect a group of buildings to carry on the manufacture of its line, consisting of machinery for working sheet metals, including presses, squaring and rotary shears, tinsmith's tools and the like. The company states that its building plans are the result of a steady expansion of its trade both domestic and foreign.

PRICE CHART.



ORDERS AND INQUIRIES FOR RAILROAD EQUIPMENT.

The Baltimore & Ohio railroad has announced the placing of equipment orders recently determined upon amounting to more than $3,500,000, which with its August orders makes a total of about $10,000,000. The recent orders are for 20 Atlantic type passenger locomotives with the Baldwin Locomotive Works, for 34 consolidation freight locomotives with the Richmond branch of the American Locomotive Co., 500 ventilated box cars with the Ralston Steel Car Co., Columbus, 50 refrigerator cars with the Whipple Car Co., Chicago, 1,000 box cars with the Standard Steel Car Co., Butler, Pa., and two electric locomotives with the General Electric Co.

The receiver of the Cleveland Railway Co. has been authorized by Judge Tayler to purchase 25 winter cars. The road is admitted to be in need of considerably more than this number, but no more were allowed.

Chicago, Sept. 13.—The Lehigh Valley is reported in the market for 3,000 freight cars. The Seaboard Air Line is in the market for 1,000 box cars and 25 stock cars, each of 60,000 pounds capacity, 40 automobile cars, 1,000 felt-lined, ventilated box cars, three 70-foot passenger cars, three 70-foot baggage cars, four 70-foot mail cars and five 70-foot express cars.

The New York Central is in the market for 116 passenger coaches of various types.

AUXILIARY FIRE SYSTEM CONTRACT AWARDED.

San Francisco, Sept. 11.—The Board of Public Works has awarded the contract for furnishing 2,378 tons of steel specials needed for the auxiliary fire system, to Charles C. Moore & Co., at a cost of $332,976. Representatives of eastern companies objected to the award, protesting that re-advertising for bids would result in considerable saving in the cost, but the commissioners of the public works declined to rescind an action which they considered just and legal.

While the commissioners have undoubtedly been influenced in their action by a desire to patronize home industry, it is not certain that the specials will be made in San Francisco, as Moore & Co. obtain their supplies from the source offering the best terms. Structural iron and steel continue arriving in considerable quantities, and additional orders are constantly being placed with agents, though little is said concerning those transactions, because they have become almost daily occurrences.

Local fabricators report some improvement in the iron industry, with prospects for greater improvement in the near future.

Plant Taken Over.—A dispatch from New York announces on authority of Vice President J. B. Brady, of the Standard Steel Car Co., Pittsburg, the purchase by that company of the plant and equipment of the Baltimore Steel Car & Foundry Co., at Curtis Bay, Md., a suburb of Baltimore. The plant has a capacity of 40 cars per day and for some time past has been operated under the management of a receiver. Mr. Brady announces that the purchase was consummated three weeks ago.

Orders for Wheels.—The Schoen steel wheel plant of the Carnegie Steel Co. during the past week received an order from the Pennsylvania lines west for 16,800 pressed steel wheels for new freight equipment on cars being built this fall, and also received an order from the Baltimore & Ohio railroad for 8,000 wheels for freight equipment and the pressed steel wheel equipment on 70 new passenger cars. These orders practically fill up the Schoen plant to capacity for the remainder of the year.

New Plant Building.—The West Bergen Foundry Co., Jersey City, N. J., manufacturer of grate bars, dead plates, elevator and sash weights, which was burned out of its former quarters last July, announces that it has secured a location about 400 feet from its former site. A new building, 50 x 75 feet, with a bay 20 x 75 feet, is being built of concrete block with the only wood in the structure used in the roof and window sash and frames. The company expects to be ready for business about Oct. 15.

Wages Advanced.—The bi-monthly adjustment of the wage scale between the Republic Iron & Steel Co. and the Amalgamated Association of Iron, Steel and Tin Workers took place at the offices of the former company, Pittsburg, on Tuesday of this week. The adjustment brought an advance from 1.25c or $5.12 per ton on the boiling scale to 1.35c or $5.375 per ton, which will govern the wage scale for the next two months.

"A" furnace of the Wisconsin Steel Co., Chicago, was lighted Aug. 27.

COKE PRODUCTION IN 1908.

A report compiled by E. W. Parker of the United States geological survey shows that the coke production of the country in 1908 amounted to 26,033,518 short tons valued at $62,483,983 against 40,779,564 tons in 1907 valued at $111,539,126. The production in 1907 exceeded that of any other year and the price was higher.

The production in 1908 was 36.14 per cent less in quantity and 43.98 per cent less in value than in the preceding year. The average price per ton in 1908 was $2.40 against $2.74 in 1907.

In 1908 the production from beehive ovens was 21,832,292 tons or 83.86 per cent of the total. The decrease in 1908 was 37.93 per cent from beehive ovens and 25.08 per cent from retort ovens.

Coal to the amount of 39,440,837 tons was consumed in the industry. It was valued at $45,222,474 which is $17,261,509 less than the value of the coke produced.

STRIKE SETTLED.

The strike at the Pressed Steel Car Co.'s works, at McKees Rocks, was settled Sept. 8., both sides claiming a victory.

Following is the official statement of the company issued immediately after the strikers voted in favor of returning to work:

In order to correct certain misleading statements appearing in the newspapers, the Pressed Steel Car Co., through its general manager, J. B. Rider, makes the following statement:

The company has not agreed or promised to increase at this time the wages of its workmen, but does expect that as general business conditions improve, its workmen will share in the benefits resulting therefrom. Up to the present time, while there have been additional orders for cars, there has been no improvement in prices.

The company has not promised to abandon the piece pooling system, but if it develops that this system can be improved, by increasing the number of pools and reducing the number of men in a pool, this will be done.

The company has arranged that the amount deducted for accident insurance shall be plainly stated on the pay envelopes and the men receive cards certifying that they are entitled to benefits under the insurance plan.

The company has never knowingly tolerated any imposition upon its employes and intends that all employes shall always have fair and proper treatment. For this purpose it has established an information bureau for the investigation of any complaints its employes make, and all complaints that have already been made have been and will be promptly investigated. The company will not tolerate any grafting or other imposition.

Joliet stack No. 3, of the Illinois Steel Co. was blown out Aug. 12; south stack No. 7 was lighted Aug. 22.

IRON AGE SOLD.

No Changes Contemplated in Policy or Staff.

Announcement is made that negotiations have been consummated whereby ownership of the David Williams Co., publisher of *The Iron Age, The Metal Worker* and *Carpentry and Building,* has passed to other interests, in which Charles T. Root, C. G. Phillips, I. A. Mekeel and Wm. H. Taylor are the predominating figures. The price currently reported in connection with the sale is $1,500,000. The Williams Printing Co. does not figure in the transfer.

The Iron Age was founded 55 years ago at Middletown, N. Y., under the name of *The Hardware Man's Newspaper,* which was changed a few years later to *The Iron Age.* Headquarters of the journal were removed to New York in 1864, and four years later, John Williams, founder of the journal, sold it to his son, David Williams, by whom it has since been published.

It is announced that no changes are contemplated either in the policy of the publication or in its editorial and business staff. Charles Kirchhoff, who has been associated with the paper for 32 years, will remain as an official of the company and in charge of the editorial department. Mr. Root is publisher of *The Dry Goods Economist* and several other trade publications. Both Mr. Phillips and Mr. Mekeel have been associated with him for many years and Mr. Taylor is best known as publisher until recently of *The Engineer.*

PRODUCTION OF COKE.

Coke production in the upper and lower Connellsville districts for the week ending Saturday, Sept. 4, amounted to 421,320 tons, of which 272,254 tons were from the upper and 149,066 from the lower district, according to the Connellsville *Courier.* Out of the total of 38,558 ovens, 32,474 were active. The production of the previous week was 416,354 tons, divided into 267,740 tons in the upper district and 148,614 tons in the lower. The idle ovens that week numbered 6,427. Consumers' ovens manufactured 280,489 tons during the week and 135,865 tons were manufactured for the open market.

Shipments were 5,221 cars to Pittsburg, 7,497 to points west of Pittsburg, and 861 east of Pittsburg. While fears have been expressed of a car shortage in other parts of the country the Connellsville region is having no trouble in that regard.

The labor conditions were improved during the week, but there is still a scarcity of miners. Laborers are beginning to return from the old country. Most of the plants were able to make the full six days' run, but others ran on a five day schedule.

COKE EQUIPMENT CONTRACT.

The Keystone Coal & Coke Co., Greensburg, Pa., has placed a contract with John W. Seaver, consulting and contracting engineer, Cleveland, for the machinery equipment for its rectangular ovens at Huron, Pa. This equipment will embody Mr. Seaver's latest improvements in coke oven machinery, and will consist of a coke leveller equipped with a device for raising and lowering the leveller ladder, coke pusher, and receiving and screening pan for the coke when it is pushed from the ovens. This pan is arranged to thoroughly screen the coke and receive the breeze, and will be lifted from its position in front of the oven and moved out to receiving coke cars by means of a gantry crane, which is included in this contract. This crane will be of a special high-speed type. The machinery throughout will be of extra heavy construction, and individual motors will be provided for each movement of the machine. All clutches and similar devices have been eliminated. The entire outfit is to be shipped within three months, and will be built for Mr. Seaver by the Alliance Machine Co., Alliance, O.

Steel Plate Construction.—The Treadwell Construction Co., which recently acquired the plant of the Rust Boiler Co., Midland, Beaver county, Pa., announces that the plant has been re-equipped with tools of the latest type and that the company is now prepared to undertake all kinds of steel plate construction, including crooked and difficult kinds of structural work, blast furnaces, open-hearth furnaces, metal mixers, converters, ladles, scale and transfer cars and all kinds of tank, bin and pipe work.

New Scrap Firm.—Hazard, Mudge & Co., Buffalo, have been incorporated and will do a general scrap iron business, with offices in the Ellicott Square building, Buffalo. The members of the firm are Ernest C. Hazard, of the well known firm of Hazard, Coates & Bennett, dealers and smelters of spelter, babbitt and scrap iron at Rochester, N. Y.; Edmund W. Mudge, of E. W. Mudge & Co., Frick building, Pittsburg, and Harcourt N. Trimble, also associated with Mr. Mudge at the Pittsburg office.

MILL CAPACITY

Of America Sheet & Tin Plate Co. Now In Operation.

Under date of Sept. 8, 1909, the operating department of the American Sheet & Tin Plate Co. reports as in operation 150 mills or 68 per cent of its serviceable tin plate capacity and 145 mills or 80 per cent of its serviceable sheet mills in operation. The report includes under the head of its serviceable tin mills 221 out of a total of 242 owned by the corporation. The sheet mills not reported as in operation are Mercer 5, Aetna-Standard 23, Canton 5 and Dresden 4. In the tin mill department the number of mills reported either not in operation or not serviceable are American 11, Anderson 7, Humbert 6, La Belle 10, Laughlin 23, Morewood 8, New Castle 6, Sharon 6 and Shenango 15. Of this number, 21 are reported as not serviceable, leaving 71 of the company's tin mills serviceable but not in operation. The following summary shows the mills now in operation in both sheet and tin mill departments:

TIN MILLS.

Name of plant and location.	No. of mills in operation.
American, Elwood, Ind.	17
Cambridge, Cambridge, O.	7
Chester, Chester, W. Va.	7
Crescent, Cleveland, O.	6
Monongahela, Pittsburg, Pa.	8
National, Monessen, Pa.	25
New Castle, New Castle, Pa.	14
Pennsylvania, New Kensington, Pa.	8
Pittsburg, New Kensington, Pa.	8
Sabraton, Morgantown, W. Va.	10
Sharon, South Sharon, Pa.	14
Shenango, New Castle, Pa.	15
United States, Demmler, Pa.	11
Total	150

SHEET MILLS.

Vandergrift, Vandergrift, Pa.	37
Leechburg, Leechburg, Pa.	11
Hyde Park, Hyde Park, Pa.	6
Saltsburg, Saltsburg, Pa.	4
Canal Dover, Canal Dover, O.	11
New Philadelphia, New Philadelphia, O.	12
Guernsey, Cambridge, O.	11
Midland, Muncie, Ind.	7
Piqua, Piqua, O.	1
Old Meadow, Scottdale, Pa.	8
Scottdale, Scottdale, Pa.	9
Struthers, Struthers, O.	6
Wellsville, Wellsville, O.	10
Wood, McKeesport, Pa.	12
Total	125

Sheet and tin mils, number of mills in operation, grand total 295.

The New Tariff.—The American Iron & Steel Association has published in neat booklet form the metal schedule of the tariff of 1909, giving comparisons with the Dingley tariff. This is a very valuable compilation, which will be of general interest to the trade.

The Scott Iron & Steel Co., Carnegie, Pa., is in the market for two cranes, one 15-ton and one 25-ton capacity, 50-foot span for 220-volt direct current.

NEW CARD

Changes Method of Quoting Extras—An Effort to Simplify the System.

The new classification of extras on steel bars and shapes announced under date of Sept. 1 by the Carnegie Steel Co. has caused more comment among both buyers and sellers than any recent action in the business. It is a radical innovation and is felt among many of the leading producers that in simplifying the steel bar card a step in the right direction has been taken.

The new card differs from the former classification in that the extras shown are all net and that the list is half the extras of the old list, it being the purpose to quote as is now done on the hoop list, a base price, plus net extras. A further change is the including in the extras for angles, channels and tees, the $2 per ton advance formerly asked over base bars and a $3 per ton differential on hexagons.

The effect of these changes will be that one base price will be quoted applying to all material on the card and that net extras as shown on the card will be added instead of half extras, as heretofore. The actual change in the extras is small, although it is noted there is some difference in the smaller sizes of rounds, a slight change in the base size of tees, a decrease in the extras on the larger sized ovals and an advance in some of the smaller flat bars. Several new sizes are also introduced.

The quantity differentials are advanced 5c per 100 pounds, making the differential larger for quantities of less than one ton of a size but not less than 1,000 pounds, 15c per 100 pounds; and for quantities less than 1,000 pounds, 35c per 100 pounds.

The extras for cutting to specified lengths are changed where the old card read: "24 inches and longer at 5c per 100 pounds" so that the new card reads: "lengths over 24 inches, 5c per 100 pounds."

The base sizes in rounds have been extended to take in 3 1/16 inch, reading on the new card ¾ inch to 3 1/16 inch instead of ¾ inch to 3 inches.

The advances on rounds and squares are as follows:

5/16 inch..... 5c per 100 pounds.
9/32 inch..... 5c per 100 pounds.
1/4 inch.....15c per 100 pounds.
15/64 inch (a new item in the card .....25c per 100 pounds.
7/32 inch.....50c per 100 pounds.
3/16 inch.....25c per 100 pounds.

The classification is changed from 3 1/16 inch to 3½ inches to read 3⅛ inches to 3 9/16 inches, and from 3 9/16 inches to 4 inches to read 3⅝ inches to 4 1/16 inches; from 4 1/16 inches to 4½ inches to read 4⅛ inches to 4 9/16 inches and from 4 9/16 inches to 5 inches to read 4⅝ inches to 5 inches.

On channels there is no change in the extras and no change affecting values. The same is true of angles.

In tees the base is changed from "1½ inch x 1½ inch x 3/16 inch and heavier but under 3 inches" to read "1½ inch x 1½ inch x ¼ inch and heavier but under 3 inches." In the 3/16 inch which was formerly the old base on tees, there is an advance of 10c per 100 pounds.

1½ x 1½ x ⅛, an advance of 10c per 100 pounds.

1¼ x 1¼ x ¼ (and heavier), an advance of 5c per 100 pounds.

1¼ x 1¼ x 3/16, an advance of 10c per 100 pounds.

1¼ x 1¼ x ⅛, an advance of 10c per 100 pounds.

1 x 1 to 1⅛ x 1⅛ x 3/16, an advance of 10c per 100 pounds.

1 x 1 to 1⅛ x 1⅛ x ⅛, an advance of 10c per 100 pounds.

⅞ x ⅞ x ⅛ and thicker, an advance of 10c per 100 pounds.

¾ x ¾ x ⅛ and thicker, an advance of 15c per 100 pounds.

On channels, angles and tees, instead of fixing a base size without extras and then quoting 10c higher than the bar price, 10c extra is charged on the card on base sizes, so that quotations on everything covered by the Merchant Steel Card may be made at one price plus full extras on Card.

On hexagons, the new card is equivalent to a decline of 10c per 100 pounds throughout, while on ovals, what has heretofore been base sizes, there is a decline of from 5c to 10c, the 5/8 inch to 11/16 inch is reduced 5c per 100 pounds, the 9/16 taking a decline of 10c per 100 pounds and the ⅜ inch taking an advance of 10c per 100 pounds. ¾ inch and larger is reduced 5c per 100 pounds. Other items of ovals remain unchanged.

Half ovals and half rounds remain unchanged throughout the list, which is also true of light bars and bands.

Flat bars and heavy bands are unchanged, except the ½ x ⅜ inch to 7/16 inch, where there is an advance of 5c per 100 pounds; ½ x ¼ and 5/16 inch an advance of 5c per 100 pounds; 7/16 x ⅜ an advance of 20c per 100 pounds; 7/16 x ¼ and 5/16 inch, an advance of 20c per 100 pounds; ⅜ x ¼ and 5/16 inch, 25c per 100 pounds.

At the South Tacoma shops of the Northern Pacific railway, orders have been recently received for the construction of 800 flat cars and 100 cabooses in addition to the 800 box cars now building at this plant. All of this equipment will be rushed to completion. The car wheels will be supplied by the Griffin Wheel Co., from its South Tacoma shops, which are adjacent to the Northern Pacific car-building plant. Up to date, 7,000 wheels have been ordered from the Griffin Wheel Co.

UPSON MILL CONTRACTS

Awarded to Mesta Machine Co., Deliveries to be Made Early Next Spring.

Pittsburg, Sept. 15.—The Mesta Machine Co., Pittsburg, on Tuesday of this week secured a contract for the complete mill equipment of the new steel plant of the Upson Nut Co., Cleveland. This order includes 46 x 60-inch reversing engines, a complete 24-inch blooming mill, including shears, tables, etc. The auxiliary machinery will be electrically driven, as will also be the screw-down on the blooming mill. Deliveries will be made early next spring. The Mesta Machine Co. has also secured a contract from the Forged Steel Co., Butler, Pa., for an all steel motor-driven shear, which will cut hot slabs 6 inches thick by 48 inches wide, this being one of the largest shears of this kind ever constructed.

Inquiries and sales on ferro-manganese and other alloys have not been very heavy during the past week, and prices remain unchanged at $43, Baltimore, for spot delivery; $43.50 to $44 for last quarter of this year, and $44 to $45 for the first half of next year. The freight from Baltimore to Pittsburg is $1.95.

The Westinghouse Air Brake Co. yesterday declared the regular quarterly dividend of 2½ per cent and an extra dividend of 1½ per cent.

NEW PLANT FOR THE PUGET SOUND IRON & STEEL WORKS.

The Puget Sound Iron & Steel Works, Tacoma, Wash., manufacturers of logging engines and general machinery are building a new plant. The following buildings have been laid out: Foundry, 90 x 126 feet, with a 15-ton traveling crane; machine shop, 70 x 260 feet, with a 25-ton crane; forge shop, 80 x 90 feet, with a 25-ton crane; store house, 50 x 80 feet; pattern shop, 50 x 90 feet, fireproof, and office building, 40 x 50 feet. The new plant will be completed as rapidly as possible.

Running as Usual.—William Hjorth & Co., manufacturers of wrenches, pliers and hardware specialties, Jamestown, N. Y., whose plant was visited by fire Aug. 27, state that they have advanced far enough with the necessary repairs to be running the factory as usual. The principal damage was to stock and no new machinery will be needeed.

MERCHANT MARINE

Strongly Advocated by Congressman Burke—Prosperity Predicted.

The Pittsburg Foundrymen's Association held the first meeting of its fall and winter program at the Fort Pitt Hotel, Pittsburg, on Monday evening of this week, the speakers of the evening being Congressman James Francis Burke and Dr. J. A. Holmes, of the United States geological survey.

Mr. Burke spoke upon the effect of tariff legislation upon the foundry and other interests in the country and said that never in the history of any nation had there been so rapid an adjustment of business conditions after any important piece of legislation as after the passage of the tariff bill by the last session of congress, all of which, he said, went to show the adaptability of the American people to any condition, and he expressed his belief that the country is now on the high road to the greatest prosperity in its history.

The congressman's remarks on the prospects of a merchant marine bill passing the next session of congress aroused the enthusiasm of the assembled foundrymen. He said he was confident that the next session of the sixty-first congress would lay the foundation for an American merchant marine, and that with the passage of such a bill the nation would no longer be dependent upon the rise and fall of its own markets, but would be in position to supply the vast foreign markets and would no longer be in the position, as during the recent memorable trip of the navy around the world, when it was fueled with coal carried by vessels of other nations of the world, when, should any of these nations withdraw their ships, the people of the United States would be sitting at home, with the prospects of their proud navy being stranded on the other side of the world owing to lack of colliers, the subject of redicule of the remainder of the world and of our own pity. Mr. Burke deprecated the disregard for foreign markets, said that there are greater markets for the resources and manufactured articles of the United States than in this country and declared that it will be impossible to much longer disregard the interests of those countries with which the United States does business. He paid a glowing tribute to Secretary of State Knox in demanding and securing a portion of the development of China, and other diplomatic moves that have benefited the country and closed by urging support for merchant marine legislation during the next congress. Mr. Burke placed the blame for the defeat of this legislation at the last session upon the shoulders of congressional representatives from the central west.

Dr. Holmes spoke of the great work the geological survey is doing at the Arsenal experimental station at Pittsburg, and Congressman Burke paid a tribute to the personal efforts of Dr. Holmes and his work in connection with ascertaining the causes of mine explosions and measures to prevent the loss of life in the coal mines of the country.

MORE BIG FREIGHTERS

For Pittsburg Steamship Co., While Small Vessels Are Being Disposed of.

President and General Manager H. Coulby, of the Pittsburg Steamship Co., gave contracts to the Great Lakes Engineering Works, of Detroit, last week, for three bulk freighters of the largest class. They will be duplicates of the Thomas F. Cole, being 600 feet over all, 580 feet keel, 58 feet beam and 32 feet deep and will carry 12,000 tons on favorable draught. This makes five 600-footers that the Pittsburg Steamship Co. has contracted for this season. When completed, the Steel Corporation will have 15 600-footers on the lakes and 19 vessels altogether with a capacity of more than 10,000 tons per trip. Considered as a unit the vessels of the Pittsburg Steamship Co. now have the largest average carrying capacity by far of any of the lake fleets, as President Coulby is steadily pursuing his policy of getting rid of his smaller vessels. About 15,000 tons of steel will be worked into these three ships which will, of course, be supplied by the Steel Corporation.

It is reported also, but not confirmed, that Boland & Cornelius, of Buffalo, have given an order to the Great Lakes Engineering Works for a 9,000-ton bulk freighter. This makes a program of 17 vessels under construction at lake ship yards for 1910 delivery—nine by the American Ship Building Co., and eight by the Great Lakes Engineering Works.

Ore is being moved rapidly, but a slump has taken place in the coal trade, so that many vessels are returning light. The congestion caused by Labor day has been relieved and vessels are obtaining fair dispatch. Bidding for grain carriers is quite active and vessel owners are content with the situation.

ANNUAL REPORT OF LA BELLE IRON WORKS.

The annual report of the directors of La Belle Iron Works, Steubenville, O., covering the business of the company and its subsidiary companies for the year ending June 30 was made to the stockholders at a meeting in Wheeling, Sept. 14.

The income account shows net earnings after deducting charges for maintenance and repairs approximating $517,000, amounting to $1,854,830.14, from which is deducted $40,436.41 for exhaustion of minerals, extinguishment of lease values, etc., leaving net profits amounting to $1,814,393.73. Deducting interest on 6 per cent gold bonds, $143,710, and cash dividends of $8 per share, amounting to $793,120, the year's surplus stands at $877,563.73. The company's net surplus after deducting $250,000 for depreciation is now $2,063,218.18.

A comparative statement for the five years beginning 1905 shows that the company's profits for the year are about $70,000 less than in 1905 and 1906, and about $58,000 more than last year. As is to be expected, the profits for the year just ended are materially less than they were in 1907. The difference in favor of 1907 is $642,753.

Owing to the depression, the furnace department was not worked to its full capacity and the mines were worked only to a sufficient extent to supply ore requirements. The production of ore was 227,205 long tons. The company's coke property was closed during the greater part of the year, as prices were such that it was deemed better to buy and conserve the natural resources of the company. The coke plant is now running at practically full capacity.

The pig iron production was 130,898 tons, a decrease of 25 per cent. The production of slabs and billets, plates and skelp, sheets, tubular goods and nails were all increased.

The board in conclusion congratulates the stockholders on the maintenance of dividends at the usual rate on an increased capital, while the plant was kept at the highest state of efficiency and a substantial addition made to the surplus account.

Painted Post, N. Y., is in the market for equipment for a new waterworks system and has advertised for bids for constructing the plant, laying water mains and furnishing the pumping machinery and various other equipment.

PLANT OF TIDEWATER STEEL CO. SOLD.

(Special Telegram.)

New York, Sept. 15.—The plant of the Tidewater Steel Co., located at Thurlow, near Chester, Pa., was yesterday sold at auction to Daniel M. Coffin, representing New York interests, for $350,000. No announcement is made concerning the future of the property. There is outstanding $600,000 of preferred and $1,500,000 of common stock, the holders of which will realize little. The company was organized in 1898, but operated for only a short time, closing down until it was forced into bankruptcy 18 months ago.

BOLT PRICES ADVANCED.

(Special Telegram.)

New York, Sept. 15.—Following a meeting of the nut and bolt manufacturers in this city yesterday, announcement is made that bolt prices have been advanced about 5 per cent. On square nuts, an advance of $2 has been made and on hexagonals, $3.

Bar iron is in better demand and is firmly established on a basis of 1.50c at eastern mills. Practically all interests are now selling plates and structurals on a minimum of 1.50c, Pittsburg, with steel bars 1.40c.

CONTRACT FOR ARMOR PLATE.

A contract for 2,000 tons of armor plate has been placed by the British admiralty with William Beardmore & Co., Glasgow. The contract price is about £200,000, and the plates are for the latest type of Dreadnought which is being built at Greenock by Messrs. Scott & Co. The armament, it is reported, will show a great improvement on that of the earlier Dreadnoughts, the steel being of special thickness and strength over the more important parts of the hull. The price is about $100 per ton higher than is being paid by the United States government for armor plate.

The Domhoff & Joyce Co., of Cincinnati, has been appointed agent for the sale of Rhoda gas coal of the Stonega Coke & Coal Co., for Ohio, Indiana and all of the west. This coal is specially adapted for malleable and gas purposes.

The Hanging Rock furnace, at Hanging Rock, O., will go into blast this week on foundry iron. The stack will be run on foundry, malleable and basic, as the market demands. Rogers, Brown & Co. are selling agents.

PERSONAL.

D. F. Bush, of Crocker Bros., New York City, has returned from an European trip.

Benj. Nicoll, head of the New York house of B. Nicoll & Co., arrived home from England Sept. 15.

W. S. Pilling, of Pilling & Crane, Philadelphia, left Wednesday for a four weeks' tour of the west.

Leonard Peckitt, president of the Empire Steel & Iron Co., returned Sunday from a brief European trip.

Herbert Dupuy, chairman of the Crucible Steel Co. of America, has returned from a European trip.

R. H. Wolff, 445 Broadway, New York, American representative for the Heroult electric furnace, is in Europe.

John A. Topping, chairman of the Republic Iron & Steel Co., has gone to Canada on a hunting and fishing trip.

President W. A. Thomas of the Thomas Steel Co., Niles, O., returned last Wednesday from an extended tour of Europe.

E. H. Gary, chairman of the United States Steel Corporation, sailed Wednesday for this country after a two months' vacation abroad.

C. F. Gregory, eastern sales manager for the International Harvester Co., has returned to New York from a three-weeks trip in the great lakes country.

Leonard S. Down, formerly with the International Heater Co., has become western representative of W. A. Russell & Co., steam specialties, with headquarters in Chicago.

A. F. Baumgarten, of Pittsburg, has accepted the management if the iron and steel department of the Geo. M. Newhall Engineering Co., Philadelphia, and will be located at Philadelphia after Sept. 15.

Thomas Cantley, second vice president and general manager of the Nova Scotia Steel & Coal Co., Ltd., New Glasgow, Nova Scotia, was in Philadelphia and New York last week on a brief business trip.

John W. Good, a well known business man of Dayton, O., has been elected treasurer of the Lucas Pump Co., of that city. Mr. Good will fill out the unexpired term of R. E. DeWeese, who resigned recently and is now taking a trip abroad.

Edward P. Dickinson, for 14 years with the sales department of the Jones & Laughlin Steel Co., has become vice president of the William Galloway Co., Waterloo, Ia. He will have charge of the manufacture of agricultural implements and gasoline engines for that company.

Chas. M. Schwab will speak before the Philadelphia Traffic Club at its October meeting. William A. Sproul, general freight agent of the Cambria Steel Co., is president of this organization, which has about 250 members.

Robert Geddis, assistant general manager of sales for the Jones & Laughlin Steel Co., in charge of the hot rolled department, will leave this week for a three or four weeks' trip, visiting the trade along the Pacific coast. He will incidentally spend two or three days at the Seattle exposition.

Hutton H. Haley has succeeded to the entire business of the O. V. Dodge, Jr., Co., Kansas City, Mo., western representative of the J. D. Smith Foundry Supply Co., Cleveland. The business will be carried on under Mr. Haley's name with the same accounts as previously represented by the above company.

The Seneca Chain Co., Kent, O., announces the appointment of W. A. Hengstenberg as secretary and general manager. Mr. Hengstenberg, who was formerly vice president of the Newhall Chain, Forge & Iron Co., New York, will have entire charge of the company's business including management of the Kent and Mansfield plants.

H. S. White, James W. Downer and John Duncan, each bearing the title of assistant general manager of sales of the National Tube Co., Pittsburg, have resigned. J. J. Kennedy, formerly credit manager, has been appointed general manager of sales, and David H. Ramsbottom has been made assistant general manager of sales. G. E. Benson has been appointed credit manager to succeed J. J. Kennedy.

The annual meeting of the American Institute of Chemical Engineers will be held at Philadelphia, December 8-10. A program of papers is being arranged and several excursions will be made to chemical works in that vicinity. J. C. Olsen, Polytechnic Institute, Brooklyn, N. Y., is secretary.

Vice Consul Chamberlain located at Singapore reports to the state department that the production of tin in the Malay states during the first five months of the year fell off from 20,616 tons in 1908 to 18,413 tons.

E. H. Harriman, who died Sept. 10, was a director of the Colorado Fuel & Iron Co., that being the only industrial company with which he was prominently identified.

Rise Follows Harriman's Death

The stock market for last week was inclined to be unsettled and irregular. The death of E. H. Harriman on Thursday was followed by a remarkable advance in prices, but there were declines again toward the end of the week. Tuesday, stocks opened with prices from 1 to 5½ points lower, and the trading was not heavy, except on the Harriman issues. The market closed weak. Wednesday, the influence of news as to Mr. Harriman's health was the most influential factor. Prices sagged somewhat but recovered later in the day. Grain markets were firm and higher upon unfavorable government reports. Thursday, Mr. Harriman died, it is said about 1:30, although the news of his death did not reach the market until after the time of closing. Rumors of his death were heard all day and the market closed with prices the lowest of any point in the week. Friday, 1,542,300 shares were traded in and advances ranging from 1 to 13 points were scored. United States Steel, common, was dealt in to the extent of 319,000 shares; Union Pacific, 293,000 shares; Reading, 227,000 shares. It was announced that the support the market received during the day was from a number of New York capitalists who had prepared to take care of the market in the event of Mr. Harriman's death. Saturday the market was active and 600,000 shares were dealt in during the two hours. The strength of Union Pacific and the weakness of Amalgamated copper were features of the market.

Money on call was usually 2¼ per cent. The money market was not greatly different from that of the preceding week. Time money moved in a narrow range, rates being 3 per cent for 60 days. Bank clearings for the United States were estimated at $2,573,000,000, this being $469,000,000 less than the week before. The decline was due to Labor Day. Clearances for the corresponding week the year before were $2,200,703,449. The actual report of the New York clearing house banks showed surplus decreased $7,081,725; loans decreased $4,376,800; deposits decreased $17,036,300, and the ratio of reserve 25.3 per cent, against 25.7 per cent the week before. Trust companies and non-member banks showed loans decreased $4,639,600; deposits decreased $8,063,400 and the percentage of reserve was 17.3 against 18 the week before.

Failures for the week numbered 204, against 201 the week before and 206 the corresponding week last year. Liabilities reported thus far in September were $1,871,805, against $2,745,630 the corresponding period last year.

The number of immigrants arriving in New York last week were 14,830, against 15,975 the week before. The report of the American Railway Association shows that between Aug. 18 and Sept. 1, 50,738 cars were taken from sidings and placed in service, cutting the surplus to 106,667, the smallest surplus since last October. Exports of gold from New York were $500,120, of which $500,000 was shipped to Montevideo. Imports at New York amounted to $109,834, all of it from Central and South America.

The number of shares dealt in during the week was 4,610,942, against 3,133,650 the week before, and 3,673,600 the corresponding week last year. Bonds, other than government bonds, were dealt in to the extent of $17,552,000 against $14,332,000 the week before, and $19,156,000 the corresponding week last year.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo- Sept. 11	Changes in week	Date 1909 Ann.	M'th'g.	Stock Outstanding	Dividend Basis	Last Declared	Date Last Div. Pay.
Allis-Chalmers	15⅜	+ ⅜	Sept.	2	$19,820,000		.....	.....
Allis-Chalmers, pr	51⅞	—1⅛			16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	12½	— ¼	Feb.	2	41,233,300		.....	.....
American Can, pr	82¼	—1½			41,233,300	7 cum	1¾ Q.	July, 1909
Am. Car & Foundry	67	— ⅞	June	24	30,000,000		½ Q.	July, 1909
Am. Car & Fdy., pr	118	—2			30,000,000	7 n. c.	1¾ Q.	July, 1909
American Loc	58¾	— ⅝	Oct.	19	25,000,000	5	1¼ Q.	Aug., 1908
American Loc, pr	114⅛	— ⅞			25,000,000	7 cum	1¾ Q.	July, 1909
American Ship	64	—1	Oct.	13	7,600,000	4	1 Q.	Sept., 1909
American Ship, pr	110	.....			7,900,000	7 cum	1¾ Q.	Oct., 1908
Am. Steel Foundries(new)	58	—1	Dec.	2	17,184,000		.....	.....
Barney & Smith	30	.....	June	1	2,000,000	4	1 Q.	Sept., 1907
Barney & Smith, pr	100	.....			2,500,000	8 cum	2 Q.	June, 1908
Bethlehem Steel	34	—1¼	April	6	14,862,000		.....	.....
Bethlehem Steel, pr	67	—2			14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	44	— ⅝	March	16	45,000,000*	3	1½ S. A.	Aug., 1909
Cambria Iron	46¾	+2½			8,468,000*	4	2 S. A.	Sept., 1908
Chicago Pneumatic Tool	33	+2	Feb.	15	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	43	—2⅜	Oct.	18	34,235,500		3½	April, 1902
Crucible Steel	14	+ ¼	Oct.	20	24,578,400		.....	.....
Crucible Steel, pr	81½	.....			24,436,000	7 cum	1 Q.	Mar., 1909
Empire Steel	10	.....	April	27	1,254,770		.....	.....
Empire Steel, pr	70	+5			2,500,000	6 cum	3 S. A.	July, 1909
Fay & Egan	90	.....	Feb.	18	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan, pr	110	.....			1,000,000	7 cum	1½ Q.	Aug., 1909
General Electric	165½	—1	May	11	65,178,800	8	2 Q.	July, 1909
Harbison-Walker	29½	—1½	Jan.	18	18,000,000		½	Oct., 1907
Harbison-Walker, pr	95	.....			9,690,000	6 cum	1½ Q.	April, 1909
International Pump	49	+ ¾	June	8	17,762,500		1	April, 1905
International Pump, pr	88⅞	— ½			11,350,000	6 cum	1½ Q.	Aug., 1909
Lackawanna Steel	56½	+2½	March	10	34,971,400		.....	.....
Lake Sup. Corp	27¾	+ ¼	Oct.	6	40,000,000		.....	.....
New York Air Brake	87½	+1½	June	17	8,012,500	8	2 Q.	Oct., 1907
Niles-Bement-Pond	100	.....	Feb.	3	8,500,000	3	1½ Q.	Sept., 1909
Niles-Bement-Pond, pr	100	.....			2,000,000	6 cum	1½ Q.	Aug., 1909
Otis Elevator Co	59	—1	March	15	6,375,300		1½ S. A.	Oct., 1909
Otis Elevator Co., pr	100	+1			6,295,000	3 n. c.	1½ Q.	July, 1909
Pa. Steel	68	.....	May	10	10,750,000		.....	.....
Pa. Steel pr	116	—1			16,500,000	7 n. c.	3½ S. A.	May, 1909
Pittsburg Coal Co	22½	+ ⅛	March	9	28,104,600		.....	.....
Pittsburg Coal Co., pr	61½	— ¾			27,071,800	7 n. c.	1¾	April, 1905
Pressed Steel Car	49½	—1¼	Feb.	17	12,500,000		3	Aug., 1904
Pressed Steel Car, pr	107½	+1½			12,500,000	7 n. c.	1¾ Q.	Aug., 1909
Pullman	193	—2	Nov.	10	100,000,000	8	2 Q.	Aug., 1909
Railway Stl. Spring	49⅞	— ⅞	March	4	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring pf	105½	—2½			13,500,000	7 cum	1¾ Q.	July, 1909
Rep. Iron & Steel	38¼	— ⅜	Oct.	20	27,191,000		.....	.....
Rep. Iron & Steel, pr	106⅞	+ ⅛			20,416,900	7 cum	2 Q.†	Aug., 1909
Sloss-Sheffield	85	—1½	March	10	10,000,000	5	1¼ Q.	Sept., 1909
Sloss-Sheffield, pr	119¾	.....			6,700,000	7 n. c.	1¾ Q.	July, 1909
U. S. Pipe & Fdy	31⅛	—2¼	June	23	12,500,000	2	½ Q.	Dec., 1907
U. S. Pipe & Fdy. pr	84	—1			12,500,000	7 n. c.	1¾ Q.	Sept., 1908
U. S. Steel	79	—1⅛	April	19	508,302,500	3 n. c.	¾ Q.	Sept., 1909
U. S. Steel, pr	125⅜	—1⅜			360,281,100	7 cum	1¾ Q.	Aug., 1909
U. S. Steel, 5s	114¾	.....			463,798,000	5	5 A.	.....
Va. Iron, Coal & Coke	68	.....	Sept.	21	9,073,680		.....	.....
Westinghouse Elec	85	—1	June	16	27,173,200	10	2½ Q.	Oct., 1907
Westinghouse Air Brake	119½	+ ½	Oct.	5	14,000,000*		2½ Q.	Aug., 1909

Par value of shares, $100, except those starred (*), $50.
†¼ ex. and 6¾ to apply on deferred dividends.

Copper Stocks.

New York.—Amalgamated Copper closed 78¼, a loss of 5¾.

Boston.—Butte Coalition closed at 25, loss ⅜. Calumet & Arizona, 105¾, loss ¾. Calumet & Hecla closed 675, loss 5. North Butte, 60¾, loss 2½. Quincy closed 91, a gain of 1.

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February	5,346
March	5,396
April	5,508
May	5,533
June	5,551
July	5,572
August	5,597

September 16, 1909.

ONE PANIC, AND SOME OTHERS.

The present splendid recovery of business confidence and resumption of manufacturing activity give little time for retrospection, and yet it will not be amiss to make a comparison of the recent trade depression—"the panic of 1907", as it is called—and the panics which have preceded it. Because of the financial stringency which began in the fall of 1907, many industrial companies were forced into receivership proceedings,—the weaker ones eventually into bankruptcy,—where probably they would have found themselves, independently of any panic; the stronger ones weathered the storm, and most, if not all, have had the receivers discharged and are in complete possession of their plants and business. Another effect of the stringency was to cause enormous shrinkages in paper values and to destroy confidence,—but, there was comparatively little loss to legitimately invested capital: manufacturers still owned their plants, their debts were not such as to alarm them unduly, and in fact, most of them had reserves which had been carefully guarded and conserved. This condition was reflected in the deposits hoarded up by the small savings-banks depositors, who shrewdly took advantage of the sharp decline in stocks, and invested all or a part of their savings in gilt-edge securities at very attractive prices. These were some of the conditions of the panic of 1907. In other panics, it had been different: manufacturers had lost their capital, their plants and their credit, and had gone down to financial ruin, the wrecks of their enterprises strewing the shore of the industrial sea. A good comparison might be made by employing the figure of a price chart, previous financial depressions may be represented by a line curving downward and forward, and then upward, to indicate the depths to which capital fell, and the actual money losses sustained by manufacturers and their slow recovery. The later disturbance, now happily a thing of the past; fairly may be represented by a straight line, to indicate that, while manufacturing interests did not make any money for a year, or longer, they did not lose large sums; therefore, the end of the "panic" found them not much worse off than when it began. And, in the meantime, while plants were idle or running on reduced time, knowing that prosperity must eventually return, they employed some of their reserves in making the repairs which would put their works in shape to take care of the increased business, which now is pouring into their offices every day. These orders for improvements, placed with makers of engines, boilers and other equipment, kept some plants well employed long after many other industries were complaining of stagnation. After these contracts were disposed of, there naturally followed a period of slackness, which even now forms the one exception to the general rule of industrial prosperity. But this condition will be short-lived, and is only a case of historical repetition; the immense business anticipated by all interests will make necessary new plants and enlargements of old, so that in a very short time, the makers of engines, boilers, etc., will find themselves, not wondering why they do not share in the general good times, but, wondering where they can secure material promptly, and how they are to complete the constantly growing number of contracts within the specified time and save themselves from penalties.

OUR IMPORTS OF PIG IRON AND FERRO-ALLOYS.

The monthly government returns of imports class with pig iron the ferro-alloys, spiegeleisen, ferro-manganese, ferro-silicon, ferro-chrome, ferro-tungsten, etc. On these monthly returns our monthly summary of imports and exports is based, but as is often noted the figures returned as referring to "pig iron" include the ferro-alloys and are therefore not enlightening as to the fluctuations in the importation of the ordinary pig iron of commerce, since in what may be considered normal years only small tonnages of ordinary pig iron are imported, while these tonnages of ferro-alloys imported are many times as large. The monthly statistics refer to "general imports," which are imports for immediate consumption and imports for warehouse. There is another class of statistics, which refer to "imports for consumption," including imports for immediate consumption and withdrawals from warehouse. In a given year, the totals in the two sets of statistics will vary, by the variations in warehouse stocks, although in long periods they necessarily strike a balance. In the statistics of imports for consumption the ferro-alloys are segregated from ordinary pig iron, and from these we have compiled the following

IMPORTS OF FERROUS METALS GROSS TONS, FISCAL YEARS ENDING JUNE 30.

	1905.	1907.	1908.	1909.
Ferro-chrome	196	162	26	68
Ferro silicon	10,275	12,653	11 892	8,816
Spiegeleisen	88,224	82,422	18 505	3,594
Ferro-manganese..	62,064	94,543	58,101	64,107
Pig iron, etc.....	110,480	366,754	108,116	22,172
	271,239	556,534	196 640	98,747

In September, 1906, foreign low phosphorus pig iron began to be imported on the Atlantic seaboard in considerable quantities, and in the next month Mid-

dlesbrough No. 3 foundry pig iron began to appear in cargo lots. The movement continued uninterruptedly through the fiscal year ended June 30, 1907, that year showing a total of 366,754 tons of ordinary pig iron, but this included a relatively minor tonnage of special grades. The important pig iron import movement having started about October, 1906, the importation of 110,480 tons of pig iron in the fiscal year 1906 may be regarded as the normal tonnage, in a year of full demand, covering various special grades of iron, and ordinary iron imported at points remote from producing centers. The fiscal year 1908, although covering, in its early portion, a few months of high pressure, showed only 108,116 tons of pig iron imported.

Accordingly it may be said that in a year normally active, but not presenting conditions favoring the importation of ordinary grades of pig iron at such ports as New York and Philadelphia, about 100,000 tons of pig iron of various grades may be expected to be brought into the country, while in a time presenting abnormal conditions, with the importation of such iron as Middlesbrough No. 3 in cargo lots to Philadelphia and other ports, the imports have increased by 260,000 tons in nine months, or at the rate of 350,000 tons a year.

On the other hand, in a year of very poor demand, like the fiscal year ended June 30, 1909, the imports even of special grades of pig iron, and of pig iron at ports remote from producing centers, drop to insignificant proportions, to 22,172 tons in the year mentioned. The point is of obvious importance, when the general statistics for the year show nearly 100,000 tons of "pig iron" imported, the remainder being made up of ferro-silicon and manganese metals.

It will be observed from the statistics of the past four years, given in the above table, that our imports of ferro-manganese have regularly been large, reaching 94,543 tons in 1907, and dropping only to 58,101 tons in 1908. These imports have followed pretty closely the course of steel production. We do not import ferro-manganese merely to add to a regular supply of our own, for our own production has risen and fallen. In the past five calendar years, our production has fluctuated between 62,186 tons in 1905 and 40,642 tons in 1908. In periods of slack demand we decrease our own production, but decrease our imports somewhat more.

With spiegeleisen, the case is somewhat different. In times of poor demand our own production is practically adequate, as we imported only 3,594 tons in the fiscal year 1909, whereas, in the fiscal year 1906, we imported 88,224 tons. In the past five calendar years, our production has fluctuated between 283,430 tons in 1907 and 111,376 tons in 1908.

While our production statistics for calendar years separate spiegeleisen and ferro-manganese, the semi-annual statistics combine the two products, so that separate statistics for ferro-manganese and spiegeleisen cannot be compiled for fiscal years from the published data. Grouping spiegeleisen and ferro-manganese, we make the following comparison of domestic production and imports for fiscal years ending June 30, the figures representing gross tons:

FERRO-MANGANESE AND SPIEGELEISEN.

Fiscal years.	Production.	Imports.
1906	325,482	150,288
1907	312,342	176,965
1908	252,166	76,606
1909	157,310	67,701

It may be deduced from this presentation that in a year of full domestic activity, such as is now being experienced, but without such pressure as would involve the importation of ordinary, foundry or steel-making pig iron, we should expect to import about 300,000 tons of special pig iron and ferro-alloys at the various ports, and of ordinary pig iron at remote ports. If the monthly "pig iron" imports, published by the government, show, say 25,000 tons a month, or between 20,000 and 30,000 tons, the movement may be regarded as normal, while any excess over the limit should, generally speaking, be regarded as showing the importation of ordinary pig iron, due simply to a scarcity at home.

The Llewellyn Iron Works, San Francisco and Los Angeles, Cal., manufacturer of elevators, etc., has secured quarters in Seattle in the new Seattle Ice company's building.

The Gawley Foundry & Machine Works, Tacoma, Wash., has established a branch office and warehouse at 1215 First avenue south, Seattle.

BRAZILIAN IRON INDUSTRY.

A National Effort for Reduction of Iron Ore.

Consul-General George E. Anderson, of Rio de Janeiro, furnishes the following information concerning the proposed establishment of iron and steel works in Brazil with government aid:

The government of Brazil has determined to develop iron smelting, and the iron and steel industry generally, and thus make use of the vast deposits of iron ore which exist in several portions of the country, notably as outlined in a previous report from this consulate-general. In a message to congress, on July 8, President Peçanha has asked authority to give whatever aid may be necessary for the establishment and maintenance of iron smelting and working upon a large scale. As the basis for the request he calls attention to the fact that in the last three years Brazil has imported iron and steel, manufactured and otherwise, to the value of $100,198,000, and expresses the opinion that the establishing of this industry is a necessary condition for the industrial development of the country, the maintenance of its international financial relations, and its protection in war as well. He cites the examples of the United States, Great Britain, and Germany as countries which have developed immensely as a result of the establishing of the iron industry, and cites Italy and Japan as examples of nations which have considered the development of the iron industry as of such economical importance that the governments of the countries themselves have undertaken its exploitation. He believes, however, that it will be better for Brazil to attempt development by aid to private capital rather than by government ownership.

It is understood that congress will give an early and favorable response to the request of the president, and that the aid will take the form of an offer of a subsidy to one or more companies which will undertake to establish a smelting plant or plants and to work iron and manufacture steel for such purposes as Brazilian industry is in a position to contemplate. Similar subsides have been offered from time to time in recent years, but not in sufficient amount to induce any company to undertake the work. It is expected that with a substantial sum as aid, and with the development of the rich ore deposits now brought within the world's consideration there will be no difficulty in inaugurating the work.

The Thomas Steel Co., Niles, O., is now ready to start the recently completed hot mill additions to its plant. These additions have been in course of construction during the summer, and will double the former output.

The Marine Pipe Shop of Seattle has filed supplementary articles of incorporation changing the name of the concern to Marine Pipe & Machine Works.

AMONG MACHINERY MAKERS.

PITTSBURG.

Interesting Features of the Change From Bad to Good Times.

Office of THE IRON TRADE REVIEW,
510 Park Building, Sept. 14.

At no time during recent years has the machine tool trade experienced such a reversal of conditions within so short a time as within the past two months. From almost a standstill to capacity orders and a situation where delivery promises are from three to seven months into the future is the way the trade now stands.

No particular branch of the trade is feeling the boom more than another, but engineering companies making a complete line of presses, chiefly hydraulic, seem to be in the lead. Wheel and forging presses, plate shaping presses, and steam hammers, have been contracted for in large numbers and one central Pennsylvania concern has orders booked up beyond the first of next year and refused to quote for deliveries beyond that time. Shears and roll lathe equipment for heavy duty work figure prominently in the list of inquiries and there are several Pittsburg and near-by concerns which are now figuring on planers, shapers and boring mills of larger capacity than they now have in their plants, or in adding to their present equipment.

Brown & Zortman, Pittsburg, has secured the agency for a new type of punch and shear, in that the body of the machine is made of built-up structural shapes and plates, instead of the former type of cast iron or steel bodies. The firm have already placed several of them in operation, chiefly in boiler-making plants where heavy stock is handled.

Machine tool representatives, reporting on the inquiry from boiler makers for additional tools, are pretty nearly of one mind in saying that manufacturers of water tube boilers seem to have the call on new trade and are making most of the inquiries.

The hard times of the past two years has made itself felt in another direction as far as machine tool manufacturers are concerned. The absolute necessity of reducing requisitions on the part of master mechanics, this amounting almost to a refusal to recognize them on the part of the final powers who pass upon these questions, has put operating forces on their mettle to an extent greater than for some time heretofore, and they have gotten along without equipment which, in good and prosperous times they would have considered indespensable, and about which there would be no questions asked by the final powers referred to above. An instance of this is the motive power department of the Pennsylvania lines, west. Before the panic there were plans and specifications for several big additions to machine shop equipment and serious talk of establishing one or two plants to take care of repair and construction work. With the coming of the panic, these plans were dropped, but most of the repair work went ahead just the same and today these lines have 95 per cent of their locomotives in operation, doing as much if not more work than they ever did before, and only one-half of the remaining 5 per cent need general overhauling. The repair and overhaul departments did all the work during the hard times when there were no appropriations for new machine equipment in the shops, and when it was almost like throwing up a job to ask for an appropriation. Necessity brought out the highest efficiency and a better knowledge of what old equipment could be made to do.

One of the reasons for the long-time delivery promises now being made on new machine tools is the fact that very few manufacturers during the hard times built any considerable number of machines for stock to draw against with the renewal of business which came on so rapidly. Another is that the belt-driven standard tool is more or less going out of style. Most of the new machines for which orders are now being placed, will have to be built to order, incorporating special ideas, and to meet particular requirements of the purchasers. The lull has given prospective purchasers time to look around, see what is being offered by all manufacturers and then pick out what they want from several machines, and, putting in a few of their own, the special orders resulted, and all, apparently, decided upon what they wanted at about the same time.

A still further complication came about from the situation on motors for motor-driven tools. Adjustments and applications of direct or alternating current, depending upon the power plants of buyers, made it next to impossible for tool manufacturers to build for stock, they preferring to wait until they had the order before putting money and time into speculative stock machines. The electrical manufacturers are as full of business as any other line and are unable to give anything like close deliveries on present orders, and this, in turn, is holding back machine tool manufacturers.

MILWAUKEE.

Increasing Business not in the Nature of a Boom.

Sept. 14.

"Contrasting this year with 1908, I should say, roughly, that business is at least 50 per cent better than it was at that time," said L. F. Bower, first vice president of the Allis-Chalmers Co., speaking of general conditions in the iron and machinery field. "The increasing growth of business is not at all in the nature of a boom. It is a sane, healthy growth and there is no danger of the re-action which almost inevitably results from a boom. Prices are not inflated and the purchases are for legitimate business purposes and not for promotion plans."

Similar expressions are heard from every interest in Milwaukee and its manufacturing suburbs, and all go to show that the period of depression which followed the fall of 1907 has almost entirely disappeared.

The Allis-Chalmers Co., being undoubtedly the greatest interest in this field, is in a position to give opinions on conditions of affairs, and Mr. Bower's words are taken as being authoritative.

A most gratifying condition in the affairs of the Northwestern Steel & Iron Co., Eau Claire, Wis., was brought out by reports of the officers submitted to the stockholders at the annual meeting last week. It was announced that the company is now on a dividend-paying basis for the first time Officers were elected as follows: President, K. Rosholt; vice president, C. T. Bundy; treasurer, R. S. Wells; secretary, H. A. Ralph; additional directors, O. H. Ingram, J. T. Barber, Charles Midlefart, T. W. Rosholt. The outlook for 1910 is reported to be most encouraging, with a complete revival in prospect early. The manufacture of gasoline engines is one of the principal divisions of the business. The company also manufactures potato diggers, reversible plows and other machines and tools.

The Superior Tractor Co. has been organized at Superior, Wis., as an auxiliary to the Superior Iron Works Co., to manufacture a steam farm tractor plow. The first plow, manufactured by

the Iron Works company, is now being demonstrated in North Dakota. The new company has elected these officers: President, P. J. Ekstrand; vice president, W. R. Hallam; secretary and treasurer, Frank R. Crumpton.

The Depere (Wis.) Electric Light & Power Co. has awarded contracts for equipment for receiving and converting power to be received from the power plant at High Falls, Peshtigo river, to the General Electric Co. The equipment includes three transformers of 100 kilowatt capacity each; one 150 kilowatt rotary converter, switchboards, etc. The company will use 300 horsepower.

The Wisconsin Capitol Commission, Madison, Wis., has awarded the contract for furnishing and installing vaults and fixtures for the west wing of the new $6,000,000 capitol, to the Art Metal Construction Co., Jamestown, N. Y., at $8,100.

The Simmons Manufacturing Co., Kenosha, Wis., which inaugurated a system of workingmen's benefits some time ago, has now installed an emergency hospital in the plant near the foundry.

BUFFALO.

New Automobile Company to Build Plant at Hornell.

Office of THE IRON TRADE REVIEW, 932 Ellicott Square, Sept. 14.

The machinery conditions in this territory continue active, with important new business coming to the front. The rumor that the DeSchaum interests would build an extensive manufacturing plant for the production of automobiles and commercial vehicles was confirmed positively today by W. A. DeSchaum, when seen by an IRON TRADE REVIEW representative. The company has just been incorporated, capital stock $150,000, and will be known as the DeSchaum-Hornell Motor Co. Associated with Mr. DeSchaum are Buffalo capitalists, including William C. Paul, R. H. Lincoln, H. J. Hopkins and the Hon. Albert R. Smith, of Tonawanda, N. Y.

It has been definitely decided that the manufacturing plant will be built at Hornell, N. Y., where a 5-acre site has been acquired and an option taken on a 10-acre property adjacent. The plant will be situated on the Erie and Shawmut & Northern railroads. The buildings will be of reinforced concrete construction. Two structures will be started within 30 days and finished ready for mechanical purposes December 1. One will be 60 x 200 ft., two stories; the other 200 x 240 ft., with glass roof. It will be a sunlight plant and will be electrically operated. There will be no overhead shafting and all machinery will be direct-driven by motors.

The company will be in the market at once for $20,000 worth of machinery equipment, most of which will be installed in factory No. 1, including lathes, drill presses, gear cutters and woodworking machinery, also appliances for the manufacture of steel bodies. It is not improbable that the manufacture of gasoline engines, suitable for the automobiles which will be put out by this plant, will early become a part of the enterprise. At present the assembling of DeSchaum machines is being carried on in a dozen different machine shops in western New York. It is expected that all the work will be centered at Hornell Dec. 1, when the first two factories will have been completed.

An interesting contest is now being waged at Niagara Falls, N. Y., for the contract for building and installing the pumping apparatus of the proposed new waterworks system in the cataract city. The entire contract involves about $750,000, of which $75,000 will probably be used in building and installing the pumps. There will be nine centrifugal pumps, six two-stage and three single-stage, electrically operated by Niagara Falls power. Five bids were submitted: Allis-Chalmers Co., of Milwaukee; Turbine Equipment Co., of New York; Devolia Engineering Co., of Philadelphia, and McCarthy Bros. & Ford, and Farrar & Trefts, of Buffalo, N. Y. The Niagara Falls city authorities have for several weeks been listening to the claims of superiority advanced by the various bidders and appear to be still at a loss to know how to dispose of the matter. They have, however, awarded the contract for building the intake in Niagara river, between Niagara Falls, N. Y., and a point near Grand Island, to the Buffalo Dredging Co.

The Starr Egg Carrier & Tray Co. is about to build a new manufacturing plant at Rochester, N. Y., which will be electrically operated, and the company is now in the market for 25 motors of about 100 horsepower capacity, besies various other electrical equipment for its plant.

The Lackawanna Bridge Co. has decided to operate its proposed plant at Buffalo by electricity, and the Allis-Chalmers Co. has been awarded a contract to install 20 30-horsepower motors. The contract involves about $20,000. The Cleveland Punch & Shear Works will build the large punches for use in this plant. The equipment of this character will be considerable.

The Buffalo Union Furnace Co. has awarded a $50,000 contract to the Allis-Chalmers Co., of Milwaukee, which will install a blowing engine in one of the company's blast furnaces, having a capacity of 30,000 cubic feet per minute. The engine will be installed within 60 days.

CINCINNATI.

Demand for Machine Tools Active—Labor is Scarce.

Office of THE IRON TRADE REVIEW, First National Bank Bldg., Sept. 14.

The demand for machine tools continues active and the plants are busy and gradually getting behind on deliveries. The scarcity of help continues to hamper operations and there has been some resort to overtime and night work. The heavy lines, such as large lathes, drill presses, radials and planers are becoming more active and orders and inquiries for these lines, which have been somewhat backward in the general improvement, are increasing steadily. The outlook is bright and the improvement is regarded as on a sound foundation. In this center there is apparently but little hesitancy to make preparations for a heavy demand for machinery and the plants are increasing their working forces as rapidly as suitable men can be secured. The stock of machines accumulated during the depression is steadily decreasing and some plants who were carrying stock 60 days ago are now cleaned up and sold up to the first of the year and beyond. The lighter lines of machine tools are still enjoying a good demand.

The most important increase in manufacturing facilities in this center reported during the week is the addition and new construction under way at the Bullock-Electric plant of the Allis-Chalmers Co. One story will be built over shop No. 2 at the Norwood plant furnishing an increase of 30,300 square feet of floor space. A new stock room will be built between shops No. 1 and No. 2, with 8,480 square feet of floor space. There will be a new impregnating house with 1,600 square feet of floor space, and an addition to the foundry is to be built 33 feet in width by 200 feet in length. The force of employes will be increased about 1,000. Contracts have been let for part of the work, but the foundry equipment has not yet been placed.

The Cincinnati Pulley Machinery Co. is now installed in its new quarters at Sixteenth street and Licking river, in Covington, Ky. The new plant affords the company about four times the floor space of its old plant.

FOUNDRY DAY

AT THE ALASKA-YUKON-PACIFIC EXPOSITION.

First Educative Demonstration of Foundry Practice West of the Mississipi Very Successful.

On Monday, Sept. 6, the interests of the foundrymen of the Pacific northwest were centered at the Alaska-Yukon-Pacific exposition at Seattle. An elaborate program, including demonstrations of modern foundry methods and equipment, was presented at the exposition foundry by the United Metal Trades Association of the Pacific coast and under the direction of Commissioner H. S. Hastings was executed with unusual precision and success. The foundry day program is an event of more than passing importance because it marks one more decided step toward the general adoption of strictly modern methods by the Pacific coast shops.

The purpose of the demonstration was purely educational and it was held on labor day so as to give the employes of the various organizations the largest possible opportunity to be present. As was stated in a circular issued by the Metal Trades Association: "There has never before been such an opportunity on the Pacific coast to procure the educational and practical features that are to be offered to you here on this holiday when your shops are closed and your employes can be present." It was the first educational demonstration of modern foundry practice that has ever been given at any point west of the Mississippi river. The success of the demonstration has assured its becoming an annual feature which will grow in importance and influence from year to year. Inasmuch as the exposition foundry is a permant building, reverting to the mechanical engineering department of the University of Washington, there will be no difficulty in finding a suitable place for holding successive demonstrations.

Attendance Large.

The attendance was very heavy, nearly every foundry in Washington and northern Oregon sending one or more representatives. In addition to this there was a constant stream of casual visitors coming and going throughout the entire day. It is estimated that the total number of people who saw all or a part of the demonstration exceeded 5,000.

At 9:30 A. M. the 22-inch cupola in the exposition foundry was charged with coke to a point 28 inches above the tuyere line; on this bed was placed a 500-pound charge consisting of 50 per cent steel scrap, 35 per cent Han Yang, Chinese pig iron and 10 per cent silvery pig. Boiler and forge shop scrap, punchings, croppings, rivets, bolts, etc., comprised the steel portion of the charge.

This mixture was followed by one consisting of 25 per cent steel scrap, 65 per cent Chinese pig and 10 per cent silvery pig, which in turn gave way to a mixture of 50 per cent car wheel centers, 40 per cent southern pig and 10 per cent silveries, this being followed by another similar mixture using car wheel rims instead of centers. The object of the last two mixtures was to show that the white, chilled rims or the gray, unchilled centers of car wheels, when used with the same proportions of pig iron, will produce identical castings, the chill having no effect after remelting.

H. S. Hastings.

Standard test bars 26 inches in length and having 2 by 1-inch cross sections were cast from each mixture and broken on an Olsen transverse testing machine, the bars being broken on 24-inch centers. Bars from the 50 per cent steel mixture broke at 3,000 pounds per square inch, with deflection of 0.3 inch and a white fracture. The 25 per cent steel mixture showed 3,500 pounds breaking strength, a deflection of 0.491 inches and a gray fracture. The bars made from the two car wheel mixtures showed identical characteristics; each of the tests indicated a transverse strength of 2,800 pounds per square inch, a deflection of 0.430 inches and a gray fracture.

At the same time, a specimen of high tensile strength manganese bronze was melted in the Steele-Harvey brass furnace and cast into ingots.

Demonstrations of the latest molding machine practice were given on three types of molding machines built by Henry E. Pridmore and The Adams Co.

The waste iron in the cupola drop was recovered in a cinder mill exhibited by the W. W. Sly Mfg. Co., weighed and saved for remelting. The spectators were deeply interested in the amount of iron reclaimed from the drop by the cinder mill.

The Afternoon Session.

Following an intermission for lunch at the New York building, was a demonstration of the forging and dressing of high speed steel by A. J. Ross, foreman of the smith department, Washington Iron Works, Seattle. These tools were afterwards tested in the machine shop, one tool was driven at a speed of 50 feet per minute through tool steel, the depth of cut being 3/16 inch and the feed 3/64 inch, for one hour without appreciable damage. The necessity for special tools designed to utilize the full benefits derived from high speed steel was vividly illustrated by the failure of the lathes at hand to drive the high speed steel tools at their most efficient speed and depth of cut.

The program was concluded with a demonstration of autogenous welding by the Seattle Oxy-Acetylene Co., and a demonstration of the thermit process of welding by the Thermit Co.

Credit for the success of the Foundry Day program is due to Herman S Hastings, commissioner of the United Metal Trades Association of the Pacific coast. In his work in connection with Foundry Day, Mr. Hastings had the co-operation of Prof. E. O. Eastwood of the University of Washington and a number of others prominent in educational and industrial circles in the northwest.

The cupola demonstration was in charge of J. H. Linton, consulting foundry specialist, Seattle, assisted by L. G. Blunt. The brass furnace was operated by A. W. Gregg of the Pacific Coast Testing Laboratory, Seattle. The molding machine demonstrations were under the supervision of R. E. Turnball, special representative of Henry E. Pridmore, Chicago.

REPORT ON THE EXAMINATION OF SOME ORE DEPOSITS IN THE DISTRICTS OF THUNDER BAY AND RAINY RIVER, PROVINCE OF ONTARIO

By F. Hille, M. E.

The total output of the iron ore mines of the United States last year was in the neighborhood of 49,683,000 tons, in addition to which there was imported 1,090,000 tons, making a total of 50,773,000 tons. Out of this amount, however, there was exported 305,000 tons, principally to Canada. So that for home consumption in the United States there remained 50,468,000 tons. From this large quantity there was produced 25,307,190 tons of pig iron, which would be equal to 1.99 tons of raw ore to one ton of pig. This proportion is somewhat higher than the average of the previous year, which was 1.87 tons. These facts would seem to indicate that last year a larger quantity of lower grade ore was mined and smelted, and for this several causes might be assigned.

1. The working of lower grade mines.

2. The exhaustion of the higher grades of ore in some of the older mines.

3. The reservation of the high grade ores.

It is hardly probable that the latter is the case on account of the extreme pressure of the iron market and the low stocks of iron ore that were on hand at the beginning of 1908. However, whatever may be the reason for it, there can be no doubt that the quality of ore that it will be necessary to use in the future will continue to deteriorate. That is to say, the percentage of metallic iron will decrease and the percentage of silica will increase. And especially will this be the case with the ores coming from the Lake Superior ranges.

The increase in the manufacture of pig iron during the last 10 years was 162.2 per cent, it having risen from 9,652,680 tons in 1897 to 25,307,191 tons in 1906, being an increase of 15,654,511 tons. If this rate of increase were to be maintained during the next 10 years, which is far from being an impossibility when we consider the rapid increase of the population of the United States, the consequent demands for increased comforts, and last, but not least, the growth of their exports to the other markets of the world, we should have to face the manufacture of 65,355,454 tons of pig iron, which at that date would probably necessitate the mining of 2¼ tons of ore for every ton of pig, which would mean mining a total of 149,299,771 tons of ore in the year 1916. If we calculate, at the same rate of increase, the total amount of ore smelted in the decade 1906 to 1916, we then arrive at the stately figure of 1,048,254,735 tons of iron ore.

From this the conclusion is drawn that much of this necessary ore will be supplied from Canada. In support of this it may be pointed out that the Steel Corporation now has extensive explorations under way in the Antokan district and that an association in which John W. Gates, Joseph Sellwood and others are interested has large properties in the Sudbury district ready for shipping to the United States. The province of Ontario alone contains immense deposits of ore scattered over a very large area sufficient to furnish a supply to the smelters both on this side and the other side of the international boundary for many years to come. Although these ores to some extent consist of a low grade magnetite, it will not be long before the iron masters will be glad to get them at whatever price they are put upon the market.

Other classes of iron ore are also found in this province, notably the large deposits of titaniferous iron ore situated both east and west of Port Arthur, which could be commercially utilized in the production of pig iron and ferro-titanium by means of the electrical furnace.

There are also large areas covered with deposits of jasper and high grade magnetite in a banded formation. These minerals, however, separate easily, and the iron could be used after magnetic separation. These deposits are found in a number of localities, but principaly along the Kaministikwia river, Green Water lake and Hunter island. There are also in this district a number of pyrrhotite deposits, in which there is frequently intermixed enough magnetite to be worth mining and roasting as soon as the price of iron ores shall have reached a sufficient height. Then there is the Michipicoten iron range, that of Hutton township in the Nipissing district, and a great number of others of more or less importance spread throughout the eastern counties.

These deposits are all situated in the province of Ontario; but if an estimate were made of what is already known of the iron ore reserves throughout the whole dominion, there can be little doubt that Canada would stand very high, if not first among the nations of the world as a prospective iron producing country.

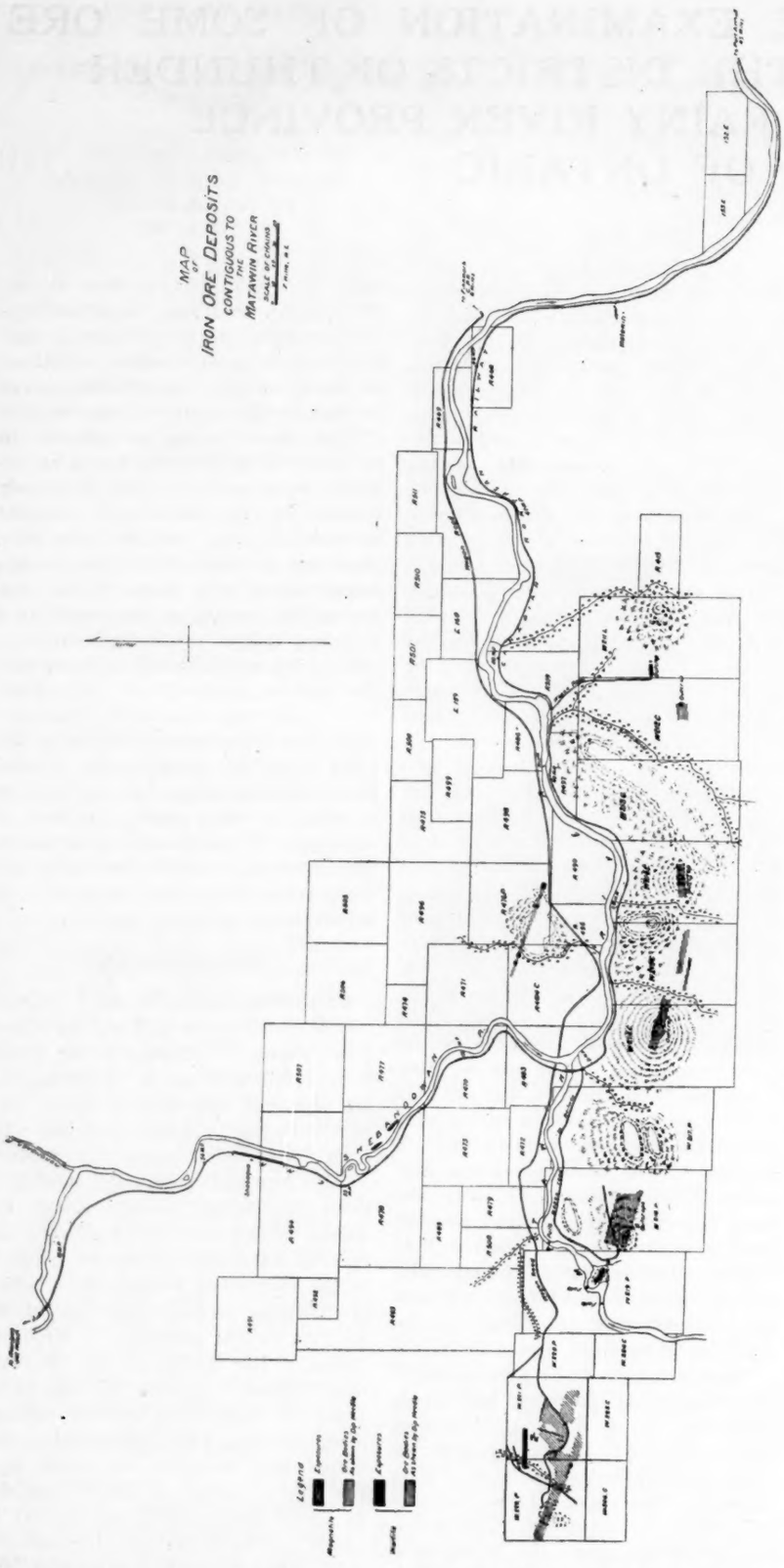
It would naturally follow from this, that as soon as their own high grade iron ore supplies are on the wane, and more especially their reserves on the Lake Superior ranges, the United States will be compelled to look to Canada for their future supplies of iron ore. The period of development for Canadian ores will also be materially advanced in the event of iron ore being placed upon the free list.

Matawin Range.

These deposits are situated close to the Matawin river and to the Canadian Northern railway, being found both south and north of them, and are first met with west of the 47 mile post (the miles being counted west from Port Arthur along the railway) to the fifty-first mile post, leaving it there and being found along the course of the river for 4½ miles farther up its course. They are situated in the district of Thunder bay, which is the most westerly but one of the districts of the province of Ontario.

Nearly the whole of the Matawin iron deposits consist of magnetite. Some of these have become oxidized in a somewhat high degree, being converted into hematite ore called martite. It is rather a difficult question to settle whether this ore was at its origin formed as a ferrous-ferric oxide (Fe_3O_4) or was converted later into this form.

Both at the extreme eastern and western ends of the range the iron deposits have an extensively banded structure, jasper and iron alternating. Very often the jasper bands are the



thicker, and in places the formation consists even exclusively of jasper.

Beginning at W-211 and ending at W-233 the deposits appeared to be very massive and of considerable extent both in length and width. They usually occupy the highest elevations of the hills, dipping with the formation at an angle of 75 degrees to the north, that is to say towards the river. North of the river there are some deposits of iron ore, which, although they have not the same extent laterally, show an ore of higher grade and somewhat banded with jasper. This ore is also magnetite.

On W-221 and 222, the largest deposits occur where they have been well exposed by stripping and trenching. The ore here is no longer a magnetite, being more highly oxidized and transformed into a martite.

It is quite possible that further exploration by magnetometric methods might reveal yet other iron deposits, in spite of the fact that I have repeatedly crossed the location both from south-east to north-west, and from north-east to south-west, and followed its boundary lines, and also followed up the common strike of the iron belt.

If these impurities can be economically separated from the iron ore the product should be an ore of at least 50 per cent metallic contents.

At the above locations the magnetic qualities of the ore are usually not very strong, varying in proportion to the amount of impurities contained, there being a few spots, however, in which the needle stands vertical. On 221 and 222 the ore is naturally, from its high oxidation, only feebly magnetic. In all cases the north side of each deposit shows negative, and the south side positive attraction, according to the induction by terrestrial magnetism.

The report finds that the ore in this district because of its massive character, can with proper methods and equipment, be mined very economically. Tests were also made with methods of hydraulic and magnetic separation and numerous analyses are given showing what can be done. For example, experimenting with dry magnetic concentration, followed by hydraulic classification and washing, upon a sample of ore from the section W-216 of the following analysis:

	Per cent.
Iron	24.16
Silica	52.07
Phosphorus	0.14
Sulphur	0.06

A product of the following analysis was obtained:

	Per cent.
Iron	66.50
Silica	6.50
Phosphorus	0.008
Sulphur	0.002

The ores of this district are of only moderate hardness so that the matter of fine grinding is not the serious obstacle to separation that it might be. Certain of the higher grade ores in which the impurities take the form of jasper bands and the ore is generally more highly oxidized lend themselves less easily to treatment. As a genral proposition the ores of

the Matawin district are amenable to separation.

A large number of analyses show an average ore analysis varying from

	Per cent.
Iron	20.02
Silica	54.86
Phosphorus	0.11
Sulphur	0.06

taken from location W-215 to

	Per cent.
Iron	38.64
Silica	43.96
Phosphorus	0.16
Sulphur	0.06

taken from location W-221.

In some instances as on location W-218, the ore is found outcropping in great hills and apparently offers opportunity for very cheap mining. The Matawin district is fairly well known but the lean and banded character of its ores have never proven very attractive to ore-consuming interests. The Atikokan district to the westward is now the scene of considerable activity and gives promise of becoming a field of active operations.

Atikokan District.

The Atikokan mineral area consists of a series of north dikes containing pyrrhotite and magnetite in lenses.

The most important exposure of these gabbro or norite dikes is east of Sabawe lake on location E-10 and 11, which has a length of about 3,500 feet by 284 feet wide at the place of the greatest width, but narrows, east as well as west, into a width of a few feet. Next we come to that on 400-402 west of Sabawe lake, which is smaller in size, being about 2,000 feet long, neither does it rise to the same height as the former, which is, at the north and south line of E-10 and 11, about 150 feet above the river; nor does it possess the same width or show the same mineralization at the surface, although the diamond drill proved that the sulphurets are as abundant here as in other places.

The length of these dike outcrops is nearly 12 miles from Magnetic lake to south of Steep Rock lake in an almost east and west line.

Origin of the Atikokan Ore Deposits.

The Atikokan ore deposits are almost a counterpart of the Sudbury nickeliferous pyrrhotite deposits, with this difference that the latter usually do not contain as great a quantity of magnetite lenses, with the exception, perhaps, of one or two instances. A certain portion of the surface of these dikes is covered with a thick layer of iron ore, sometimes extremely pure and apparently consisting of dark brown limonite and magnetite in varying proportion, this being produced by a decomposition of the sulphurets and of the magnetite.

Tests made of this material gave results high in iron, low in silica and phosphorus, and even in sulphur and nickel. The absence of nickel in harmful quantities may be explained by the leaching process that has continued for so long a period of time. The nickel has usually accumulated in the small fissures of the rock in the form of genthite. A few tests made of this material in my laboratory showed:

Iron	62.4	66.5	67.2
Silica	7.1	3.2	2.1
Phosphorus	0.02	0.015	0.036
Sulphur	Trace	0.01	0 07
Nickel	Trace	Trace	Trace
Titanium	Trace	Trace	Trace
Magnesia	0.34	Not det.	Not det.
Lime	0.13	....	....

Development Work Done.

Considerable prospecting has been done on some of these dikes, especially on that one which lies east of Sabawe lake, while those that lie west of this location have been tested by diamond drill, hand drill and powder. However, for the present I will confine my description of this work to that done on R-400 and 401, and E-10 and 11. The latter two were formerly known as the McKellar property and now as the Atikokan Iron Co.'s mine. Here the most prominent dike occurs, which for years has been repeatedly in the public eye as an iron range.

Development on E-10 and 11.

The first work done on this location consisted of a trench cut across the dike at almost its widest part, a few yards west of the survey line between the two locations. This work was done in 1887 with the object of discovering whether the iron ore, which is seen cropping out on the surface, has width and depth. I took two samples here—No. 35 from the south side, at a point where we might expect to find the upward extension of the ore lens in the tunnel, which shows there a width of 40 feet. Sample No. 36 is taken from the north part above the 8 feet and 16 feet lenses in the tunnels.

The exact width and length of the ore body at the place where the latter sample is taken could not be accurately determined, on account of the heavy drift covering. The lens of ore from which sample No. 35 comes is at that point about 24 feet in width, thinning out at a point about 20 feet to the west, and also at a point about 146 feet to the east. Analyses of these two samples, made in the laboratory of the superintendent of mines, gave results as follows:

	No. 35. Per cent.	No. 36. Per cent.
Iron	58.24	62.16
Silica	11.76	11.70
Phosphorus	0.25	0.17
Sulphur	1.21	0.15

In 1900 an irregular tunnel about 5 by 6 feet and 284 feet long was driven through the hill, under the direction of R. M. Hunter, of Duluth, Minn., exactly below the trench just mentioned above, and about 100 feet below the top of the hill. The accompanying plan will give an idea of what this tunnel revealed. I can add here some analyses of ore that came from the tunnel, and were made several years ago in my own laboratory.

From one sample the returns were:

	Per cent.
Iron	58.116
Phosphorus	0.078
Sulphur	1.90

Second sample gave:

Iron	59.03
Phosphorus	0.092
Sulphur	0.58

To this I can add the analyses from ore taken from the dump in front of the tunnel, mined by the present company during the process of widening the south entrance of the tunnel. These samples are numbered 33 and 34, the first being taken from the west side and the latter from the east side of the dump, the tests being made at Ottawa.

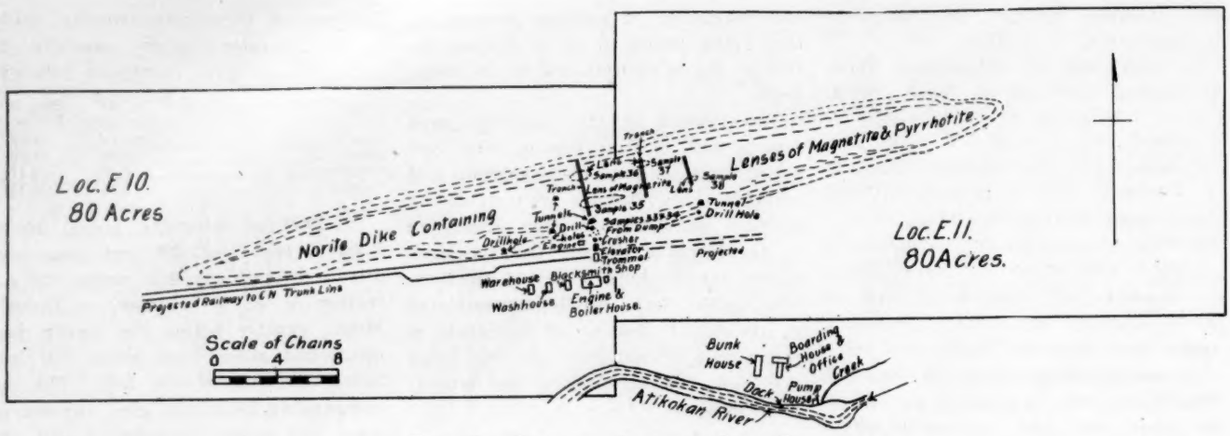
	Per cent.
FeO	27.51
Fe_2O_3	46.85
FeS_2	3.45
Mn.	..
Al_2O_3	1.01
CaO	4.12
MgO	4.06
P_2O_5	0.62
SiO_2	11.58
TiO_2	none
(H_2O etc.)	0.52

	No. 33. Per ct.	No. 34. Per ct.
Metallic iron	55.80	55.10
Phosphorus	0.27	0.50
Sulphur	1.84	2.29
Titanium	none	none
Silica	11.58	12.64

In the same year that this tunnel was completed two trenches were cut into the dike (for the situation of these see map). One of these trenches is 122 feet east of the center survey line and is about 4 feet wide. From this I took sample No. 37. The other trench is 331 feet from the line. The above sample was tested at Ottawa with the following result:

	No. 37. Per cent.
Iron	67.49
Silica	5.86
Phosphorus	0.05
Sulphur	0.11

In addition to the prospecting work mentioned here, other improvements have been made at the mine. In a straight line from the mouth of the tunnel a trestle has been erected 64½ feet long by 16 feet wide, bridging over a railway track. On this trestle



IRON ORE DEPOSITS, ATIKOKAN IRON CO.

is installed a Gates crusher 6 1/3 by 8 feet high, a bucket elevator and a sheet steel trommel 3½ by 16 feet long. To the side of this, about 13½ feet west of the crusher, is housed an engine for the purpose of operating the machinery. This whole installment is made for the following purposes: the ore to be mined will be taken by tramcar out from the tunnel and dumped into the crusher; the broken ore falling into a hopper below, thence being elevated into the trommel, from which the sized ore drops into railway cars to be transferred to the roaster and blast furnace at Port Arthur.

Locations R-400 and 401.

I now come to the other two locations situated along the Atikokan river which I examined last fall, viz., R-400 and 401. The first named is situated about 90 chains due west of Sabawe lake, but by canoe route down the river the distance is nearly doubled. As the accompanying map will show, both locations are bounded by the Atikokan river; R-400 on the southwest corner and R-401 along the whole extent of the south side.

The two claims are traversed from east to west by a dike of the same description as that described on E-10 and 11. The strike is also the same, east by 16 degrees north. Its longest diameter is 20 chains 30 feet, while the total width can hardly be estimated at present, the north side of the dike being still covered by drift matrial.

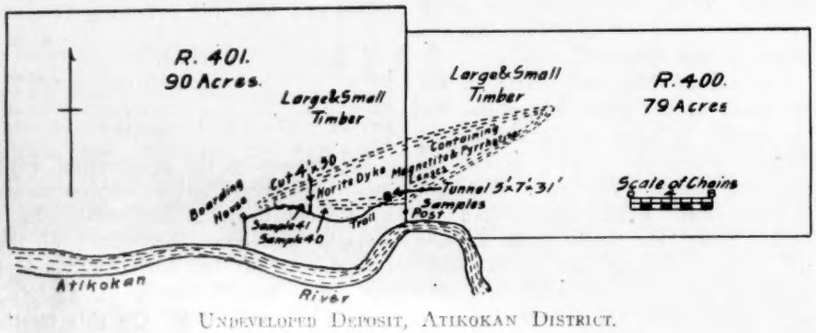
On landing from the canoe near the southwest corner post of R-401, we ascend the hill for about 80 feet, then turning sharply to the west, travel 117 feet, and there find a tunnel 5 feet wide, 7 feet high and 31 feet long. This tunnel is driven into the dike to ascertain the continuation of a magnetite deposit which was first observed on the top of the dike some 50 feet higher up.

The mineralized portion of the tunnel commences about 6 feet from the entrance and consists of lenses of magnetite mixed with pyrrhotite, pyrrhotite and rock, or pyrrhotite mixed with both magnetite and rock. Here I took two samples, No. 38 representing that portion of the ore 6 feet from the entrance to a point 17 feet from the face of the tunnel, while No. 39 represents the ore for the remaining 14 feet to the face.

NO. 38.

	Per cent.
Iron	47.48
Silica	17.53
Phosphorus	0.04
Sulphur	4.47

At the time of my examination of this location a number of miners sent



UNDEVELOPED DEPOSIT, ATIKOKAN DISTRICT.

NO. 39.

	Per cent.
FeO	31.18
Fe_2O_3	52.37
FeS_2	2.26
MnO	.....
Al_2O_3	1.30
CaO	1.45
MgO	1.71
P_2O_5	0.18
SiO_2	7.33
TiO_2	0.16
(H_2O etc.)	1.84

	Per cent.
Metallic iron	62.02
Phosphorus	0.08
Sulphur	1.26
Titanium	0.10

in by the United States Steel Corporation were prospecting in the tunnel, and also at different places on the location, east as well as west of this point. For example, 12 chains and 13 feet east from the survey line these men had stripped a small place where there was an outcrop of magnetite on the surface. Their work was not far enough advanced for me to take samples. Had I done so, however, I do not think that the results would have differed much from those that were taken in the tunnel, or from a rock cut which I found 8 chains and 50 feet west from the survey line that divides the locations.

This cut is 50 feet long by 2½ feet wide, trending from north to south and the first 14½ feet from the southern extremity contains magnetite, pyrrhotite and a certain proportion of rock. The next 29 feet consist of rock, pyrrhotite and a little iron, and the last 6 feet are in fairly good magnetite. Two samples were taken here, Nos. 40 and 41, the former from the first 14½ feet and the latter from the last 29 feet, leaving the middle, which was principally rock matter, untouched.

	No. 40. Per cent.	No. 41. Per cent.
Iron	62.58	56.28
Silica	6.90	12.56
Phosphorus	0.03	0.03
Sulphur	2.26	2.56

This is the principal work done on these locations, which have revealed nothing essentially different from the one deposits of locations E-10 and 11. Here, as on the other locations, the

minerals appear in lenses, limited in extent both in length and width, at times one, and at times the other mineral predominates.

If the sulphur in this magnetite had occurred in a different form, as a pyrite or marcasite, and the magnetite were not so dense and in lenses only, it would be possible to use it to advantage after roasting it in continuous kilns, a process which is followed at several places in Pennsylvania. In order, however, to insure success, there must be no increase of copper, which I have recently found at several places, as depth increases, neither should there be any increase in phosphorus, which appears to contaminate the ore to a larger extent in the interior of the dike. This difficulty, however, can be modified by mixing the ore with a silicious ore low in phosphorus, such as Mesabi or Gogebic, or for a time with those found in the neighborhood of Loon lake, should it be determined that the latter are sufficiently free from that undesirable element.

A few hundred feet southwest of the western extremity of the dike is a small camp consisting of a cooking and eating house, both built of logs and situated 213 feet from the river, while tents formed provisional sleeping apartments.

The nearest railway station of the Canadian Northern railway is Hematite, about 2 miles away from the point where the railway communication with these claims is established. Timber for purposes of fuel and mining is plentiful in this district.

VERNAZ MILLING FILES

Report of the Franklin Institute, Through Its Committee on Science and the Arts, on the Milling Files Invented by Alexis Vernaz, of Yverdon, Switzerland.

This file is the result of an effort on the part of Alexis Vernaz of Yverdon, Switzerland, to save from the scrap-heap a large lot of accidentally hard castings. It was so successful that it has been patented in England, France, Belgium, Germany, Austria, Switzerland, Italy, Canada, and the United States. The latter patent is No. 807,143, dated December 12, 1905. One of the claims of this patent is: "A file provided with teeth cut in the form of arcs having their bases (chords) located rearwardly with respect to the cutting edge of the teeth."

The Vernaz file is illustrated by Fig. 1.

In looking up the past history and evolution of the ordinary file we have found nothing which is not covered by the dictionary definition: "A steel instrument having raised cutting edges made by the indentations of a chisel." One patent, however, No. 44,724, dated Oct. 18, 1864, granted to H. A. Harvey, contains a claim which in itself was rather startling: "Making the teeth of files in segments of circles extending across the face, substantially as and for the purpose specified." The records of this patent were destroyed in the fire at the patent office, so that all we have is the summary in the *Official Gazette*, the drawing in which shows that it has no bearing on the case. See Fig. 2.

The essential features of the Vernaz file are the shape and depth of the teeth, which are in section like those of a milling cutter. They have an included angle of 60 degrees and a front rake of 1½ degrees. The number of teeth per inch varies from 6 2/3 to 16 according to the purpose for which the file is intended. The teeth are cut one at a time by an end mill, or hollow cylinder of 2½ to 3 inches diameter, with a conical end of 60 degrees, the axis of this cylinder being inclined 1½ degrees to the plane of the file and intersecting its center line. Automatic machines rotate the cutters, feed them into the file blanks the proper depth, withdraw them, move the file one pitch, feed the cutter in again and so on.

The first impression was that the inclination of the axis of the cutter would produce a cutting edge on the file which would not be flat, but concave. This is, of course, true of the bottom of the cut, but the top or edge being produced by the intersection of the conical face of the cutter with the cylindrical surface made by the preceding cut, was so doubtful that we have drawn it in true proportion three times natural size in order to accurately determine this point.

This is shown in Fig. 3, in which the lines *C* and *D* are corresponding elements of the cylindrical and conical surfaces of the tooth at the edge of the file and determine the corner *A* of the tooth. These are shown in greatly enlarged scale in Fig. 3. The point *A*, at this magnification, falls distinctly below the surface of the blank. By computation it is really 0.002286 inch below this surface, which is probably a benefit.

Fig. 4 is drawn with a very different ratio of cutter diameter to pitch in order to exaggerate the conditions and to more clearly show the geometrical relationship between the shape of the teeth and the cutter. In this *cd* is an element of the cylindrical front of the tooth at its center, and *ca* an element of the conical top; *na n'a'* show the elliptical bottom; *mn* a portion of

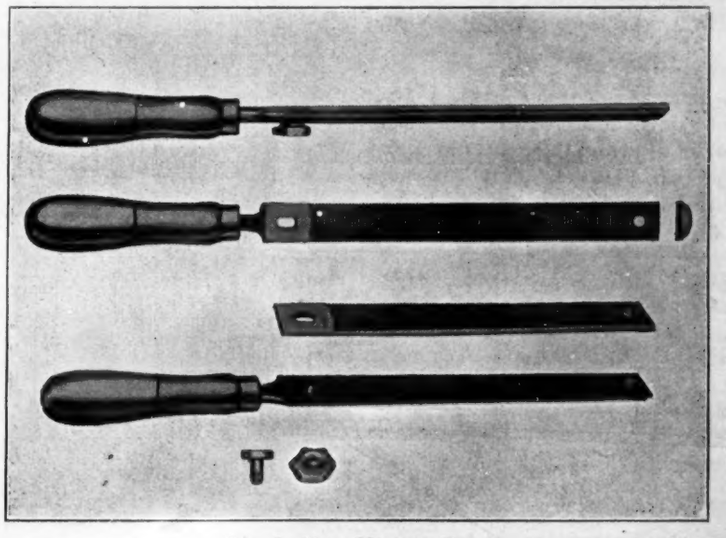


FIG. 1—THE VERNAZ FILE.

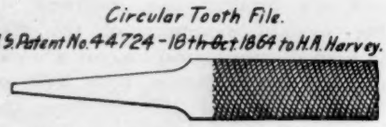

Circular Tooth File.
U.S. Patent No. 44724 - 18th Oct 1864 to H.R. Harvey.
Making the teeth of files in Segments of circles extending across the face substantially as and for the purpose specified.

FIG. 2.

the hyperbola formed by the intersection of the conical surface with the plane of the side of the file; *cm*, *c'm'* show a portion of the line of intersection of the conical surface with the cylindrical surface of the previous cut, and indicate how the point *m*, which is the corner of the tooth, drops below the top plane of the blank.

In practical tests we find that the circular shape of the cutting edges act normally to the cut whether the file is pushed straight or at an angle, and also that the relatively large pitch and depth of teeth prevent clogging and the necessity of cleaning, and produce a surprisingly smooth surface. The surface produced on steel is smoother than that from an ordinary second-cut file, due to the fact that the latter quickly retains small chips of the steel in its teeth which scratch the surface.

On all fibrous and tenacious materials like wrought iron, steel, brass, aluminum, and the alloys, the improvement over ordinary files was very marked, the cut being clean with no clogging and scratching. That the action is cutting and not abrading or scratching is shown by the chips, which under a magnifying glass are seen curled up and look as if made by a lathe or planing machine.

The verbal reports of machinists after trying these files, were found to be very unreliable by reason of their prejudices and indifference, but where any one of them had a real job of filing where metal was to be removed in good earnest he invariably became enthusiastic in his praise and was loath to part with the experimental samples.

Fortunately at this time a file testing machine built by Edward G. Herbert, Ltd., Manchester, Eng., was at the works of Sellers & Co., Inc., Philadelphia. They had just completed tests of 29 files of 11 different makes, the result of which they very kindly placed at the disposal of the committee, and also made a test of one Vernaz file which was submitted with the application. These tests were all made on standard cast iron test bars of 1 inch square section. Since then, Tinius Olsen & Co. have taken the agency for the Herbert machine, and have tested for the committee three Vernaz files on cast iron to compare with the Sellers tests, and three Vernaz and three regular commercial files on steel. The Vernaz and commercial files were bought in the open market to prevent any special preparation, and for the latter the best make known was selected. Thus there are records of 32 tests on cast iron and six on steel.

The cast iron test bars have the following composition:

Combined carbon	0.051	Sulphur	0.075
Graphite	2.988	Titanium	0 035
Silicon	1.915	Iron	92.400
Manganese	1.204	(Annealed for uniformity.)	
Phosphorus	1.332		

The steel test bars have the following composition: carbon 0.64, manganese 0.80, silicon 0.41.

The selection of the high carbon steel for the latter is due to the experience of Herbert & Co., who found that low carbon machinery steel clogged up the commercial files so very soon that any test was impracticable.

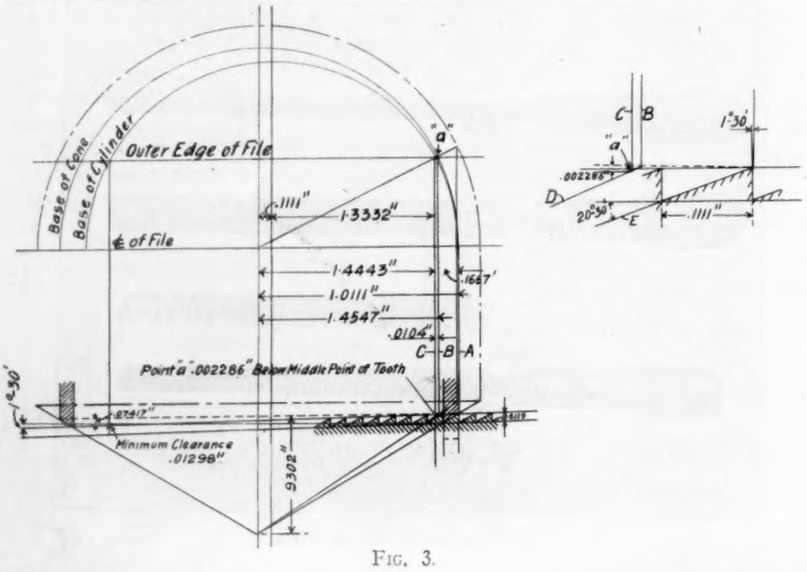


FIG. 3.

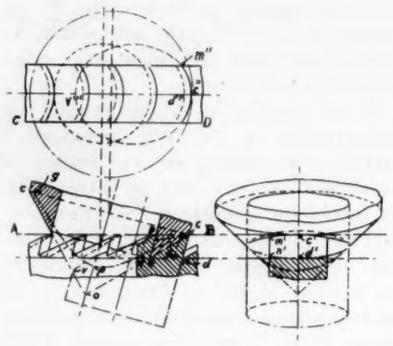


FIG. 4.

In the Herbert machine, the file is held firmly and solidly backed up in a sliding frame having a reciprocating motion of 6 inches. The end of the test bar, 1 inch square, is pressed against the file during its forward stroke and withdrawn on the return. The pressure is positive and can be altered to suit. In these tests it was 20 pounds on the cast iron and 30 on the steel.

A chart is placed upon a drum which is so geared to the motions that its axial movement records the number of strokes and its circular movement the amount of metal removed. A fixed pencil, pressed against the chart, draws a curve, the abscissae of which give the strokes, and the ordinates the length of the bar filed away. It is unfortunate that there was no means of also obtaining a record of the energy required for the removal of a given amount of metal.

These charts, in which the personal element is entirely eliminated, show astonishing results. It being understood that each test was continued until the file slid over the end of the test bar without removing any metal, 28 out of the 29 commercial files on cast iron ranged in the cubic inches of metal removed from 0.7 to 20.6, while one lone hero removed 73. The average cubic inches per 10,000 strokes varied from 1.4 to 6.34, but these figures did not correspond with the others, showing some to have better cutting qualities and others better endurance. Another curious feature was that very rarely indeed did the two sides of the file show anything like equality, the worst case being 20.6 cubic inches removed by one side and 0.4 by the other, the best case being 11.8 by one side and 10 by the other.

Of the 4 flat Vernaz files on cast iron, the worst filed a total of 48.2 cubic inches, using both sides, and the best 143.75 cubic inches, and the variation between the sides was very slight, the worst case of variation be-

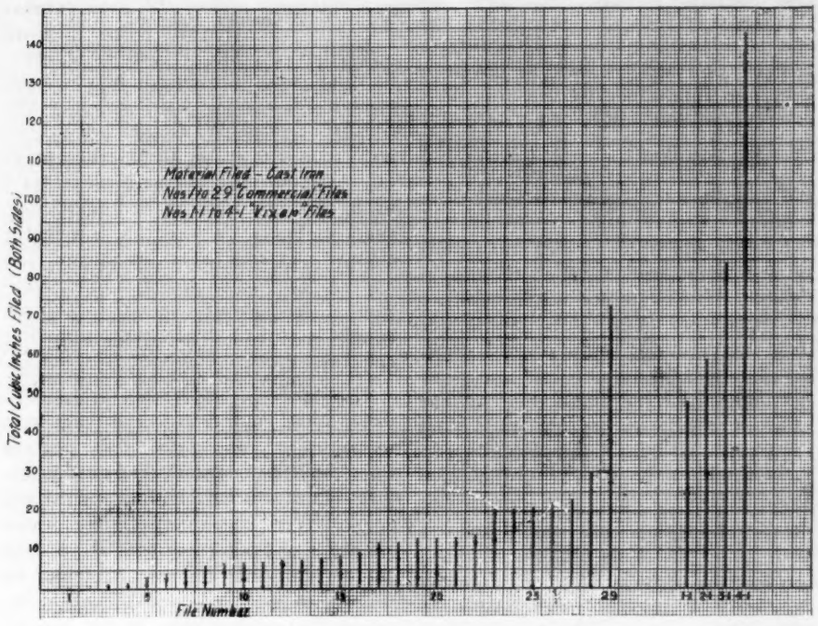

Material Filed – Cast Iron
Nos. 1 to 29 Commercial Files
Nos. H to 4-I Vixen Files
Total Cubic Inches Filed (Both Sides)
File Number

FIG. 5—TESTS OF VERNAZ FILES ON CAST IRON.

ing 49.1 for one side and 34.9 for the other.

On high carbon steel, the Vernaz files did not show such marked superiority, due probably to the fact that the best commercial files were selected to compete with them. The minimum and maximum figures for the commercial files were 3.6 and 6.4 cubic inches, and for the Vernaz files 9 and 25.8 cubic inches.

In this case, however, two out of the three Vernaz showed a marked difference in the two sides. Evidently the art of making files, after centuries of evolution, is still far from being an exact science.

The diagrams will graphically show these results. Fig. 5 shows the results of the tests on cast iron, and on account of the number of tests is arranged with vertical lines, the height of the line showing the total cubic inches removed by both sides of the file, and the cross mark indicating the difference between the two sides.

Fig. 6 shows the results on high carbon steel and is a facsimile of the lines drawn by the machine on the original charts, supplemented by horizontal straight lines showing the total cubic inches removed by each file.

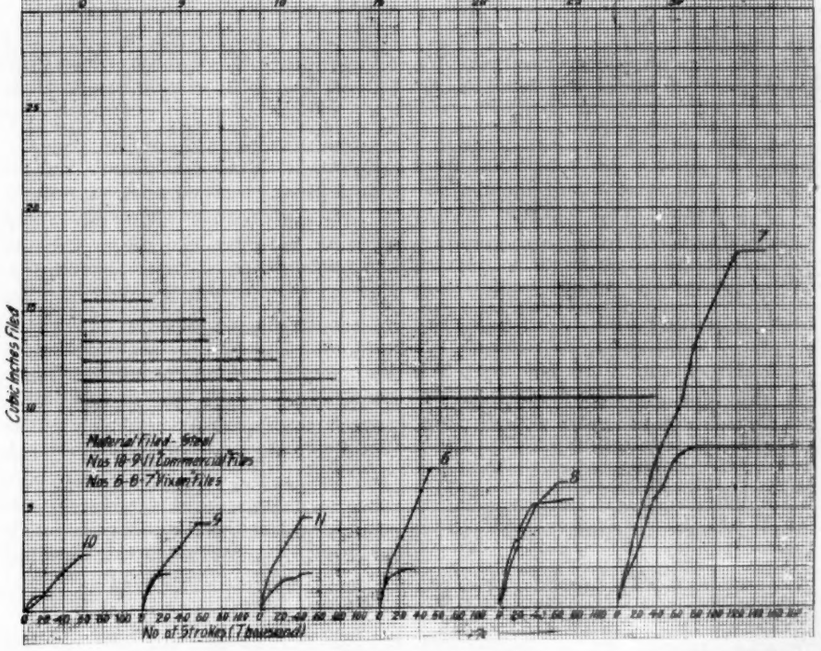

Total Cubic Inches Filed (Both Sides)
Material Filed – Steel
Nos. 10-9-11 Commercial Files
Nos. 6-8-7 Vixen Files
No. of Strokes (Thousand)

FIG. 6—TESTS OF VERNAZ FILES ON HIGH CARBON STEEL.

In conclusion, the committee considers that Alexis Vernaz has made the first radical, leading improvement in files for generations, and has done a service to the world, not only in presenting a new and efficient cutting tool for metals, to be operated by hand, but also in the impetus which the introduction of this tool will give to the improvement in cutting capacity and endurance of the regular type of files, and recommends the award, to him, of the Elliott Cresson medal.

INOXIDATION PROCESSES FOR PROTECTION OF IRON AND STEEL.

BY ALFRED SANG.

History.

Mill scale, which is mostly composed of black magnetic oxide of iron, forms a non-continuous coating and is a promoter of corrosion. Lavosier, during his memorable investigation of the composition of water in 1871, discovered the artificial formation of the black oxide (Fe_3O_4) on iron as a continuous impermeable skin and noted its stable properties. Professor Faraday, in 1858, reported on the protective properties of the magnetic oxide formed by the action of the steam in the superheating tubes of H. M. L. Bustler. Berthier discovered its formation when iron is subjected to the action of highly heated air. Finally, Prof. Frederick S. Barff, of London, being engaged in charring peat, noticed the highly preservative action of this coating, which had formed on the inside of a pipe conveying superheated steam.

Barff Process.

The Barff process was first made known in a paper read before the Society of Arts in 1876, and another before the Iron and Steel Institute in 1877;[1] it has also been thoroughly treated by B. H. Thwaite.[2] In this process the articles are heated to about 1,000 degrees Cent. (1,832 degrees Fahr.) and steam superheated to 1,000 degrees Fahr. (538 degrees Cent.) is injected into the coating chamber.

George Bower, of St. Neots (Huntingdonshire) interested himself in this process and tried using air in-

[1] *Journal Iron and Steel Institute*, 1877, p. 356.

[2] "On the preservation of iron by its own oxides." *Proc. Inst. Civil Eng*, Vol. 74 (1883), p. 255.

stead of steam; he was not successful, however, until his eldest son, A. S. Bower, conceived the idea of using a producer gas, rich in carbonic oxide, to reduce the red oxide, as obtained by air treatment, either by Barffing or by subjecting the work to acid fumes. A type of furnace well adapted for the purpose was designed, in which the air treatment lasted 40 minutes and the gas treatment 20 minutes, these being repeated alternately four to eight times. Finally the Barff patents were purchased in order to secure a satisfactory first coating of red oxide in a practical manner. The costly experiments undertaken by the Bowers had consumed close on three years.

Bower-Barffing.

The process known as Bower-Barffing consisted in heating the articles to be coated in a closed retort to a temperature of 1,600 degrees Fahr. (871 degrees Cent.), superheated steam was then interjected, forming a coating of both the black triferric tetroxide (Fe_3O_4) and the red ferric oxide (Fe_2O_3); this first operation lasted 20 minutes and was followed by the injection during 15 to 25 minutes of carbonic oxide (CO) from a gas producer, which reduced the Fe_2O_3 to Fe_3O_4. These operations could be repeated alternately any number of times until a sufficient depth of oxidation had been obtained. A Bower furnace 12 feet to 14 feet long, 4½ feet wide and 4 feet deep would treat one to two tons in 24 hours. Three attendants were required night and day for two furnaces.

The Bower-Barffing process was brought to America by A. S. Bower and introduced to the engineering world in papers read before the American Institute of Mining Engineers[3] and the American Society of Mechanical Engineers.[4] The Hecla Iron Works, Brooklyn, N. Y., were the first to use it. During his stay in America Mr. Bower was successful in his experiments of using superheated steam during the last one to two hours, and found that the best results were obtained when the steam was at a higher temperature than the articles undergoing treatment.

The process is an expensive one, the cost being said to range from $5 to $20 per ton, and probably more in many cases. The articles come out with a dark gray appearance, which changes to black on being oiled, and they are somewhat increased in size. Any sand left in castings leaves red traces resembling rust. The surface can be polished or can be given a very fine appearance by brushing with emery and oil, then dipping in a strong solution of potash, and finally cleaning with sawdust, especially if the articles have been polished before treatment.

Enamel will hold on very tenaciously and paint can be applied without trouble. Other points worth noticing are that close packing in the furnace does not prevent action at the point of contact, and the process being one of annealing, the influence on the physical condition of the iron and steel is to be considered before treatment. The coating if too thin will chip off. It is said to be a perfect protection against sea water, and on account of its close adherence when any part of it is broken off, the iron only rusts at the point exposed.[5]

The coating resists acid fumes better than does galvanizing, and it is not affected by sulphate of copper. The difference between the coefficient of expansion of the iron and the oxide being only slight, the work will stand almost any degree of heat without injury, but it can neither be bent nor machined and the temper and edges of tools would be destroyed if treated. Wrought iron requires less heat than cast iron. If part of the coating is removed, the exposed parts rust more readily than ordinary iron. The articles treated are weakened, not only to the extent of the iron which has been converted into oxide, but also by the burning out of the cinder in wrought iron, causing what is known as "dryness."

It has been found excellent for pipes used in mines and for conveying mine water, which is high in sulphur and acids; it has also been recommended for boiler tubes, but does not seem to have been adopted for that purpose. The "noble" metals can be deposited from their chlorides on the oxide coating by the Dode process. An improvement introduced later into American practice, known as the "Wells process," consists in finishing the work at one operation by using steam and carbonic oxide together, instead of applying them alternately. The Bower-Barffing process and the one which follows have been excellently described and discussed by M. P. Wood.[6]

Gesner Process.

Another process not unlike Bower-Barffing was introduced on a commercial scale some years later by the late Dr. George W. Gesner, of Brooklyn;[7] it is known as the Gesner process. The deposit in this case is said to be a compound of hydrogen, iron and carbon, or as the inventor claimed, a superoxide, plumbago and hydron, the latter being a hydrogen-iron alloy; analysis shows that there is not less than 2 per cent of hydrogen present.

The mode of operation is as follows: The coating retort is kept at a temperature of from 1,000 degrees Fahr. to 1,200 degrees Fahr. (538 degrees Cent. to 649 degrees Cent.) for a period of 20 minutes, after which steam at a low pressure is allowed to act at intervals during 35 minutes; this steam is brought into the retort through a red-hot pipe at the bottom, known as the hydrogen generator; this would imply that the steam is entirely decomposed, but this can hardly be correct, as the decomposition of steam commences at 1,000 degrees Cent. to 1,200 degrees Cent. (1,832 degrees Fahr. to 2,192 degrees Fahr.) and is completed at 3,000 degrees Cent. (5,432 degrees Fahr.) only. The last step of the process is to slowly pour in a small quantity of naphtha or other hydrocarbon and allow it to act during 15 minutes; it reduces any red oxide present and carbonates the surface. Finally the heat of the retort is reduced to 800 degrees Fahr. (427 degrees Cent.) and the articles are withdrawn.

Roofing sheets, steam radiators, architectural iron work, tubes and smaller goods were successfully treated by this method. The charge for coating small articles ranged from 4½ cents to 7 cents per pound, and for large pieces in quantities as low as 1 cent per pound. The advantages claimed over Bower-Barffing are that on account of the low heat articles are not increased in size or bent out of shape, and that there is no need of removing grease or oil before treatment. Articles treated by the Gesner process will take paint, and tables have been published showing that there is no appreciable loss of strength and no reduction of elongation in steel, although there is some in iron. The essential requisite of duplicating results was very difficult at first and large sums were expended in experi-

[3] A. S. Bower, *Transact. Am. Inst. Min. Eng.*, Vol. 11 (1882), p. 329.
[4] Geo. W. Maynard, *Transact. Soc. Mech. Eng.*, Vol. 4, p. 351.
[5] "The preservation and ornamentation of iron and steel surfaces," by Geo. Bower, before the Society of Engineers, May 7, 1883, *Transact.*, Vol. 23, p. 59.
[6] "Rustless coatings for iron and steel." *Transact. Am. Soc. Mech. Eng.*, Vol. 15 (1894), p. 998; Vol. 16 (1895), pp. 350 and 663; Vol. 18 (1897), p. 252.
[7] See *Scient. Am. Suppl.*, Vol. 26 (1888), p. 10,442; also *Jour. Iron and Steel Inst.*, 1890 (2), p. 850; also *Iron Age*, Vol. 45 (1890), p. 544.

mental work. There is a plant in operation at South Brooklyn.

In 1897 Dr. Gesner patented[8] the alloy of hydrogen and iron which he described as resisting oxidation and corrosion, being capable of working like iron and being of nearly the same strength, but of somewhat lower specific gravity. The mode of production was to blow hydrogen through iron in a converter, 1,000 cubic feet of hydrogen at 60 degrees was sufficient for 2,000 pounds of iron or steel; the temperature of the metal was to be 2,800 degrees Fahr. and the depth 15 inches.

In 1900 he took out a further patent[9] on the alloy which is formed as a scale by the action of hydrogen on hot iron; the hydrogen was to be produced by the decomposition of steam (producer gas) and the scale was to be crushed, ground and sieved for purposes not specified.

Other Processes.

The process patented by W. Dewees Wood,[10] of McKeesport, Pa., wherein sheet iron was subjected to the action of hydro-carbon vapors or gas and superheated steam within an air-tight and heated chamber, is identical in principle with the Gesner process, which it preceded. Planished iron, as commercially supplied, has a grayish oxidized surface; it is a sort of Russia iron.

There is an old process for oxidizing iron and steel by means of melted saltpeter or niter (nitrate of potassium, (KNO_3), which was greatly improved by Col. A. R. Buffington,[11] of Watervliet Arsenal, in 1884, and may be considered superior to Bower-Barffing wherever high heat would destroy some necessary quality of the articles.

The process may be briefly described as follows: Saltpeter (KNO_3) and black oxide of manganese (manganese dioxide, MnO_2) are heated together in an iron pot; the saltpeter will fuse, and when the heat is such that sawdust thrown on the surface of the dip will ignite, the pieces to be oxidized are put in cold and stirred about, then suspended for five minutes in the fumes over the pot, and finally dipped in boiling water to cool and to clean off any saltpeter which may adhere to their surface. The saltpeter must be of good quality or the results will be unsatisfactory. Cast iron takes on a fine bronze color. The oxidization is evidently due to the action of nascent oxygen.

Claudius has proposed[12] a 5 to 6 per cent solution of manganese nitrate for the production of a durable black coating or patina. The articles are dipped and then dried slowly over a fire or gas flame, the non-adherent powder is brushed off and the operation repeated as often as necessary, then rubbed with oil.

It has also been proposed to protect metal articles with a film of sulphide by subjecting them, in a heated state, and in the absence of air, to the action of the vapors of sulphur.[13] In the same way a coating of phosphide has been produced by subjecting iron plates to the action of phosphorus at a high temperature.[14] Russia iron, which was long made under a secret process by Russian manufacturers, is a steel having its surface cemented and oxidized by heating it in piles, with carbon in between the sheets; the fact that this coating was mostly Fe_3O_4 was not known until pointed out by Dr. Percy. Many variations of this process have been patented.

A slight, flexible coating of black oxide has been given to wire, which was first rusted by means of steam (the rust given by acid fumes being too loose) by heating in a special furnace and dipping in oil.[15] Oil cleaned with nitric acid, then heated and finally dipped in castor or other oil till cold will turn black.[16]

Hydraesfer Process.

Mr. J. J. Bradley, of Brooklyn, who was for years connected with the Gesner process, has developed and operated a somewhat similar process, for which certain advantages are claimed. It requires but one furnace operation, which lasts one hour or less, and the color of the product is a blue-black, equal to the finest Bower-Barffing, and can be brought out by rubbing with whale or other oil. The process, which is patented, owes its name to the use of brass in connection with the partly decomposed steam which is injected into the retort. The metal to be coated is kept at a temperature of about 1,100 degrees Fahr. (593 degrees Cent.).

Iron and steel surfaces have also been oxidized by electrolysis, the first one to attempt it being A. de Meritens.

The bath was one of distilled water at a temperature of from 70 degrees Cent. to 80 degrees Cent. (158 degrees Fahr. to 176 degrees Fahr.) and the cathode was made of copper, carbon or iron indifferently, or could be the tank itself; the work, which was preferably polished, was connected as anode; as weak a current as the water would conduct was then applied for two hours or more and the nascent oxygen given off in the presence of the dissociated hydrogen occluded in the metal, produced a film of black magnetic oxide, increasing in depth with the length of treatment.

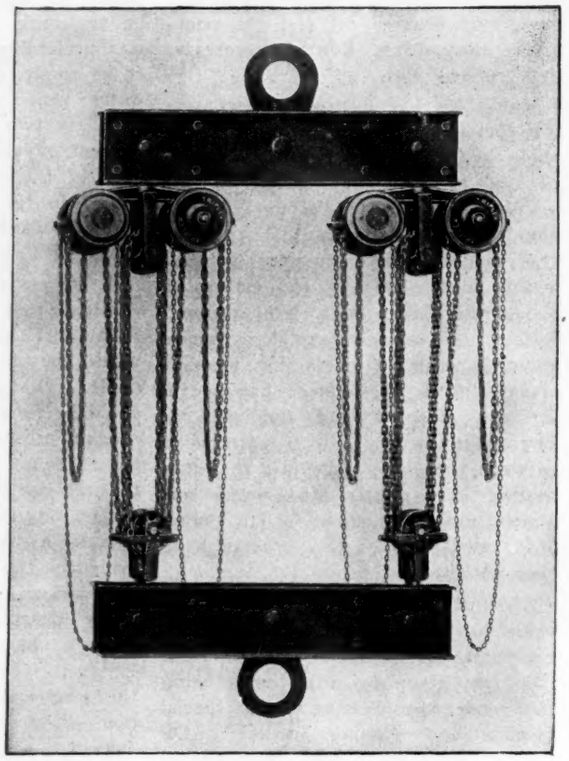
If the current was too strong, pulverulent rust would be formed, but with the lower-current rust itself would be converted into the black oxide. No permanent deep coating could be formed unless there was hydrogen present in the iron and on this account it was often necessary to first run the article to be treated as the cathode in order that it might absorb hydrogen. This process is evidently the electrical equivalent of the various inoxidation processes already described; all heat processes seem to have their electrical equivalents; it is a natural consequence of the electrical nature of chemical action.—*Electrochemical and Metallurgical Industry.*

Lining for Ore Chutes.—The majority of mining companies usually line the bins and ore chutes with sheet steel. It is seldom that the steel sheets are worn uniformly and as soon as a hole occurs it is necessary to renew the entire sheet, which often means a waste of material and extra expense. At Mineville, New York, Witherbee, Sherman & Co. found that it is more economical to use bar steel. At present they use ¾x6-inch bars. By using bars it is less trouble to do repair work and it is necessary to remove only the worn-out part and put in a new piece. All the steel may thus be used. Even short bars with one end worn thin may be used. Railroad rails of heavy weight are also good for lining the front of ore bins at a point directly opposite the place where the cars dump. They are occasionally suspended by the upper end and are free to move at the lower end. They form an excellent buffer for heavy ore as it comes from the mine car or skip.—*Eng. and Min. Journal.*

[8]Engl. Pat. No. 9 403 of 1897.
[9]Engl. Pat. No. 11,166 of 1900.
[10]U. S. Patent No. 252,166 of 1882.
[11]*Transact. Am. Soc. Mech. Eng.*, Vol. 6, p. 628.
[12]*Metallarbeiter*, Vol. 24, p. 318.
[13]P. H. Conradson, U. S. Pat. No. 311,294 of 1885.
[14]Eng. Pat. 695 of 1864.
[15]Chas. Platt, *Engineering and Mining Jl.*, 1892 (2), p. 78.
[16]Eng. Pat. No. 16,451 of 1888.

A 40-TON CHAIN BLOCK.

To meet the demand of engineers for a dependable hand hoist to handle extremely heavy loads where the insrallation of an electrical crane or a powerful steam hoist is not desirable, the Yale & Towne Mfg. Co., New York City, has developed the 40-ton triplex chain block shown in the accompanying illustration. Although the ordinary mechanical man is accustomed to think of chain blocks of the smaller capacities only, ranging from the one-eighth differential up to possibly 5-ton blocks, the larger sizes under certain conditions are just as available as the differential is for light loads. In fact, this company for several years has made its triplex blocks up to 20 tons capacity.



YALE & TOWNE 40-TON CHAIN BLOCK.

The 40-ton triplex illustrated is composed of two 20-ton units with equalizing bars at top and bottom. This provides for single point suspension and for a single point for attachment of load. The equalizing bars are made of two channels placed back to back with separators. Provision is made for the swiveling of each unit at top and bottom. The clevises or points of attachment enable the user to easily put the hoist in place wherever used and also afford a convenient point for the attachment of the load.

It will find its greatest fields of usefulness in wrecking work (especially marine); in manufacturing plants; at mines and quarries and in building operations, and generally for loading and unloading. It may be installed over railroad tracks on a properly guyed temporary or permanent trestle. Lateral motion may be secured by one or more trolleys running on a large I-beam. It is available for handling heavy ordnance, etc., where head room, cost, infrequency of lift, or other conditions do not permit the use of power cranes of sufficient capacity. The hand chains are arranged to permit two, four or eight men to work effectively. Where the load is larger than 40 tons it is generally of sufficient size to permit two of these hoists to be worked together, giving a capacity of 80 tons.

LARGE ELECTRIC MINING HOIST.

There was recently installed in the mine of the Washington Coal & Coke Co., Dawson, Pa., a large electrically operated mine hoist built by the Connellsville Mfg. & Mine Supply Co. and which presents several features of considerable interest.

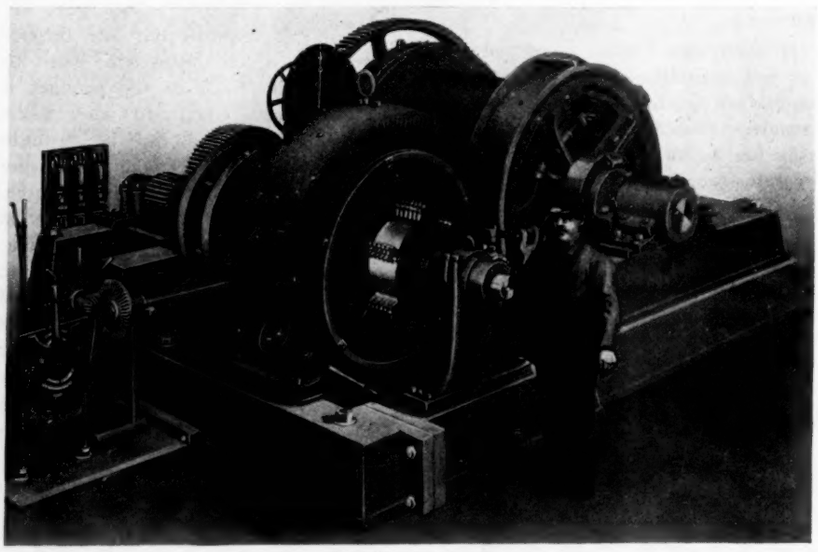
The hoist is used to haul 35 mine cars, averaging 3,800 pounds each when loaded, up a maximum grade of 8½ per cent, 8,000 feet long at a speed of 600 feet per minute. The loaded cars start at the bottom of the slope on a 4 per cent grade, which gradually increases until the maximum grade of 8½ per cent is reached near the top, where the loaded cars are pulled in on a landing on a grade of about 6 per cent and on a curve of 150 feet radius. The empty cars will be allowed to drift down the slope by gravity, controlled by a brake on the hoist drum.

The hoisting drum is 6 feet in diameter and 5 feet wide between flanges. It is fitted with a hand brake on one end, and a hand-operated friction clutch on the other end. The drum is of heavy steel construction, with a 12-inch shaft. All the gears on the machine are cast steel with machine cut teeth, the main spur gear being 10-inch face and the motor gears 13-inch face.

The frame is made in sections for convenience in installing in mine. The drum and large gears and the friction clutch are also made in two parts for the same purpose.

The hoist is driven through a flexible coupling by a 500-horsepower direct current non-reversing compound-wound Westinghouse motor. It is controlled by a standard semi-automatic Westinghouse magnetically-controlled unit switch controller. These switches are operated from the controller shown in the illustration, the controller carrying only small currents while the main motor current is handled by the magnetically operated switches, thus doing away with the difficulties from arching.

This controller has an accelerating relay which prevents the starting switches from closing too rapidly and thereby prevents excessive starting



ELECTRIC MINE HOIST, WASHINGTON COAL & COKE CO.

currents. Thus the second switch cannot close until the current allowed to flow by the closing of the circuit has fallen to a predetermined value. As soon as this value is reached the second switch closes, thereby short-circuiting a resistance section and the current rises, but the third switch cannot close until the current has again fallen to the predetermined value. This not only prevents injury to the motor from careless handling during acceleration but also insures the most rapid starting possible.

The controller also has a safety relay which opens the resistance switches in cases of excessive overload, and thereby protects the motor while running. If this relay operates while the motor is running, the motor does not stop but is automatically brought up to its full speed again. This is a valuable feature in an installation of this kind where the cars may strike some obstruction, as it affords perfect protection to the apparatus.

When it is remembered that this hoist is installed some 800 feet below the surface of the ground, the advantages of the electric transmission of power are evident, as probably in no other way could this large amount of power be transmitted so economically, nor so easily.

RANGE OF UTILITY OF HIGH SPEED STEEL

By O. M. Becker.

(Continued from last issue.)

Multiple lipped drills, rose reamers, and similar boring tools are in the same category with drills in respect to the economies to be effected and the manner of effecting them. One consideration however differentiates them to some extent. The latter types of tools, employed mainly in enlarging or truing holes already existing, take a relatively thin skin of metal only (usually more or less chilled and sand covered) instead of a chip corresponding nearly to the semi-diameter of the tool, the metal all being removed by the peripheral part of the cutting edge only. The tendency therefore is to wear the outer angle of the tool and to reduce the size. This tendency is progressively intensified when once the wear has begun, and necessitates careful watching in order that the grindings may be frequent enough to insure not only accuracy, but efficiency. The advantage of a tool that will hold an edge for a long time under such conditions, is evident. The first cost, as in the case of milling cutters, need not necessarily, in the larger sizes, greatly exceed that of less efficient tools, since inserted blades can be utilized almost, if not quite, as freely as with the milling tools. A reamer designed so as to permit the use of the body an indefinite number of times in connection with renewals of the blades, distributes the first cost in such a way that it becomes actually less, and usually much less, than that of ordinary tools.

In connection with drills and reamers one is reminded of the stock joke concerning the man who bought a high-speed bit for use in ratchet drilling and who was disappointed because it did not cut any faster than those which he had been accustomed to use. The joke has now quite lost its point, for the new steels are coming into larger and constantly increasing use in hand tools. The gain of course is not in greater cutting speed, bnt in the longer life of the tool and the greatly lengthened time during which they can be used without re-grinding. A flat drill, for example, has drilled as a regular thing, some 1,500 1-inch holes per grinding in the webs of 80-pound rails, as against about 50 holes drilled by a carbon steel drill—a gain in efficiency which practically eliminates the cost of grinding in this case. In other instances that could be cited the gain has been twice, and even three times as large.

Files and Small Tools.

The high-speed steel hand file also seems an anomaly. It is however an actuality, and seems to justify itself in that it lasts some four or five times as long on steel and iron as an ordinary one will, and after that is still suitable to use on brass and other soft metals. Such files rarely break, and this is no small additional advantage.

In hand reamers and the like tools there is an advantage greater still; for these are customarily used for accurate sizing and their life is limited to the time during which they retain their size within the required limits of accuracy. Even when made capable of slight expansibility, the life of a carbon reamer of this class is short enough. The question may well be asked in view of the very great superiority of the reamer made of high-speed steel, what profits it to use the former at half the cost when the life of the latter is ten to twenty times as long?

The same considerations which affect small drills likewise affect small threading dies, taps, and similar tools. If left hard enough for the most rapid cutting, the small cutting points or edges are too brittle to stand up to the work. Proper hardening (say by the barium process) and tempering however entirely obviates this difficulty if the design is at the same time slightly modified as pointed out elsewhere. The cutting speed is of course less than would be possible if the highest heats could be used in hardening. Taps as small as 5/16 inch have been used under these conditions at an efficiency ten to fifteen times that obtainable from carbon tools. In automatic machines the time lost in replacing dulled cutters is one of the important items which can be materially reduced by the use of the new steels. The breakage of taps is even less than with the old tools, if they have been properly treated.

In Sawing and Slitting.

It does not seem necessary to consider at length other varieties of cutting tools comparable to those already mentioned, except perhaps cutting-off saws and the like. The former in action and efficiency are affected by about the same considerations as those previously considered. Between the hack saw blade of old, and the best cutting-off saw made prior to the application of high-speed steel to such use, there is a difference, to be sure. But all tools of this class have been lamentably inefficient. The high-speed steel hack saw blade, now considerably used, of course much outlasts the ordinary sorts in both hand and power sawing. The latter mode of cutting, however, is itself very inefficient and is properly being displaced by high-speed band and circular saws. The band saw, until recently thought impracticable, if indeed not impossible, is undoubtedly the most efficient for sawing high-speed steel itself, and likewise is highly efficient for sawing all other kinds of iron and steel structures and forms where the nature of the case permits its use, as often it does not. In those cases the circular saw comes into play with a high efficiency. This of course does not cut metal as if it were wood; but certainly at a rate somewhat in keeping with present ideas of expedition.

Narrow faced milling cutters have heretofore been used, for the most part, in high-speed sawing. It is now possible however to obtain saw

plates of a considerable diameter. Such plates, in sizes above say nine or ten inches, have been rather difficult to make; and even now it is doubtful if it is desirable to use them, except possibly in special cases. The inserted cutter idea is pecularly applicable to circular saws of large diameter, and such cutters are now considerably used not only for cutting off, but for slotting and similar work. A special type of machine is required for such work, especially if heavy. A number of these are now available and give promise of taking an important place in the metal working industries. A typical case is that of a recent machine operating two saws of 73 inches diameter, cutting 1 5/16 inch slots. Such an operation would be quite out of the question but for the new steels and the inserted cutter.

Miscellaneous Applications.

There is a constantly increasing use of high-speed steels for purposes which do not involve cutting in the ordinary sense at any rate; and in which increased speed is not the end sought any more than in the case of hand tools. Among these uses are those involving the shearing of metals, including among other tools shear blades, punches and broaches, blanking dies, and cutting off dies. The economy in all these cases obviously is entirely in the longer life and the reduced number of grindings necessary. Unless small, shear blades and cutting off dies are rarely made of the solid high-speed steel stock. Usually the custom has been to bolt a relatively thin plate to a supporting block; or in the case of heavy work, brazing the high-speed face to the backing. The recently developed methods of electric and autogenous welding makes it possible to get practically solid tools at small expense for alloy steel.

Blanking dies, if small, usually are of solid high-speed steel, though there is no objection to making them with a cheaper backing. Larger dies of course always have the face only of high-speed steel. The cost of such a compound tool need not be greater, usually, than that of the ordinary kind; and frequently it may be less. The question in tools of this sort is that of getting and maintaining a clean, sharp shearing edge. Otherwise the work is likely to be indifferently done. Once the edge has begun to upset or wear away the tendency is toward a progressive deterioration until it is necessary to re-face by grinding. The superiority of high-speed steel in this kind of work is sufficiently indicated by one example. In blanking sections for agricultural machine knives, 14,000 to 15,000 pieces per grinding is considered average work for a good die of special die steel, while the total output might reach 150,000 to 160,000 pieces. A high-speed die on the same work (blanking from 11 to 16 gage polished bands of medium carbon knife steel) produces regularly 40,000 to 50,000 pieces per grinding, and the average total output is about 1,000,000 pieces—the maximum record for such a die being about 2,600,000 pieces. The saving in grinding therefore is two out of every three; and the life of the die averages that of some twenty of the special dies. A little figuring as to the cost of each kind makes a very interesting study under these conditions. Of course the relative efficiency of such dies will vary a good deal according to the material and the working conditions; but a substantial increase in efficiency in practically all cases is certain.

Increased Output in Punching.

In punching operations, properly so-called, the same high efficiency may be expected, indeed considerably higher, usually. The ordinary punch generally gives out by collapsing or breaking off after the edge has become somewhat dulled. The increasing force required to drive the tool through, that is, to shear off the metal removed to form the hole, seems to increase very rapidly the molecular fatigue or intensifies already existing internal strains to such an extent that the endurance limit is soon reached. In punches made of high-speed steel the shearing edge wears much less rapidly, and, if suitably hardened and tempered, the body resists the strains longer than in the case of ordinary tools, as is indicated by the typical performance of a 7/8-inch punch working in medium carbon channel iron 3/8 inch thick. The average life is between 50,000 and 60,000 holes, whereas that of a tool steel punch rarely reaches more than 6,000 holes. This ratio is found to be quite common. In broaching operations, such as are common in connection with malleable castings, the efficiency is, if anything, rather greater.

The objection is often made to high-speed punches, as to taps and small drills, that they are too brittle. The same answer however applies, namely, that proper hardening and annealing, to give requisite toughness, always assuming a properly selected brand of high-speed steel (for these differ a good deal in this respect among themselves) obviates the danger of breakage, or reduces it to a minimum. Small sizes of punches, when for use in punching thick and high-carbon steel, are indeed rather difficult to harden and temper to just the point where the combination of hardness and toughness is just right for maximum performance; and unless this problem has been well worked out in connection with the particular material worked upon, the increase in efficiency will be slight, if indeed there be any at all. In hot punching the gain is considerably greater than in cold, since the temper is not drawn by the hot material, as is likely to be the case with ordinary punches. For the same reason dies of these new steels are especially efficient in cutting-off and similar hot work.

Press Work Displacing Castings.

Since the advent of the readily worked low carbon sheet steels, working freely in press dies, the displacement of small castings by formed steel pieces has been going apace and the press working of sheet metals has come to be an important branch of metal working. In all but the simplest of forming dies the wear on certain parts is excessive, compared with that on others, and in consequence the dies, usually expensive on account of the very narrow limits permissible in respect to their accuracy, soon become worthless because they have become worn beyond the permissible limits for good work. Even the hardest carbon steel forming dies have a comparatively short life. This is especially true of embossing dies of intricate design. Since the principal item of expense in these tools, and especially in the latter, is in the highly skilled labor going into them, the first cost of the material is of little consequence. Anyway a part of the additional cost of the high-speed steel material can be saved by merely facing the dies with it, or making inlays at those places where the wear is greatest. In this case greater care in hardening is necessary.

In the forge shop also the new steels are coming to claim an important place. Much that has been said of forming and embossing dies applies to drop and hot press dies also. It is cheaper, that is to say, to use the more expensive material in the first place than to pay for the more frequent renewels if ordinary steel is used.

Whether because of some difficulty in hardening to a sufficient depth, or because of the drawing of the temper by hot work or for some other reason unexplained, drop and similar dies subjected to concussion frequently sink under the severe pounding which

they receive, accentuating the effects of wear. High-speed steel dies do not seem to be subject to this failing. In the heading machine, and other hot pressing operations especially, high-speed steel dies show a relatively long life. The excessive wear and the liability to drawing the temper when made of ordinary steels and thus still further reducing the effective life, suggests the advisability of discontinuing entirely the use of carbon steel for such purposes and the substitution of some form of the new alloy steels, whether properly designated high-speed or not. The possible exception is the case of those dies subjected to such tremendous pressures, as in cold heading very tough stock, that the die blocks often split. Wherever it is a matter of resisting wear and maintaining size, the new steel clearly has shown its title to preference.

Marked Improvement in Durability.

In no case has this been more notable than in such operations as wire drawing and also in cold drawing. One of the chief difficulties always is the maintenance of a uniform size in the rod or wire passing through the die. If the material is exceptionally hard and accurate sizing is essential, the difficulty is a serious one. An alloy steel die often outlasts thirty or more ordinary ones. A similar efficiency is frequently found in snap dies for riveting of all sorts, especially in rapid blow pneumatic tools. Chisels used in the same kind of tools, and those used in file cutting, also have a high efficiency, in spite of the often repeated assertion that high-speed steels are not suited to tools of this sort and to any operations involving continued concussions. It is possible that their efficiency is not so marked in these cases, and undoubtedly in certain conditions there is likely to be little or no gain in their use. Nevertheless, high-speed chisels and hammers are in successful and efficient service in such difficult work as riveting and trimming boiler plates, and chipping and hammering castings. Even a hand hammer of high-speed steel has been used to advanage in the latter kind of work. The efficiency depends a great deal upon the particular work required. Unquestionably the chief reason why many tools for similar purposes have not been made of the new steel, to any considerable extent, has been the high cost of the material. This reason no longer holds, since it is now feasible to provide almost all sorts of tools with high-speed steel wearing surfaces or cutting edges at small expense.

If then, high-speed steel has been found well suited to all these uses (as indeed it has, and to many others also) what are its limitations? Can all tools be profitably made of the new steels? By no means, or at least not yet. But in the machine and related shops, working in iron and steel, it seems probable that it might be so. It is certain that the men who have given the matter the most careful attention very generally are of the opinion that there are comparatively few uses in such shops where high-speed steel is not practicable and economical, though possibly few would care to go to the extent proposed by the superintendent of motive power of one of the largest American railways, who proposed to scrap the entire outfit of old tools and replace them with suitably and economically designed high-speed tools, for finishing jobs as well as for ordinary work.

Adaptability to Finishing Tools.

Whatever may have been the case with the early kinds, the assertions still often heard to the effect that high-speed steel is unsuited to finishing cuts are mostly twaddle, based on insufficient experience and upon experience with improperly designed or treated tools, or tools used in machines unsuited to the work in hand. Elaborate theories have been advanced to account for the lack of finishing quality in these steels—which lack does not exist, in good grades at any rate, if indeed in any. It is no uncommon experience to take finishing cuts (one cut only) from the bar at a high speed and leave a surface in every wise satisfactory and with an accuracy within 0.002 inch. In some shops finishing cuts are taken at a speed as high as 200 feet per minute, the feed being rather fine; and 30 to 50 feet is common practice. The tools and the machines, however, are properly designed and adapted to each other, and the former are hardened and tempered appropriately for finishing work. Milling cutters are very widely used for the finest kind of surfacing, and that at considerably increased speeds or feeds—generally the former, where especially good surfaces are required.

The ability to hold a keen edge, such as is presupposed where finishing cuts are concerned, has been facetiously referred to in connection with high-speed steel razors, wherewith the busy man might indulge in high-speed shaving—the hope being humorously expressed that in this case the depth of cut be not unduly increased. Whatever may be the humor in such a situation, it is said to be a fact that certain "safety" razor blades of exceptional edge-keeping quality are made of high-speed steels. Occasionally also one comes across a knife, or other cutting tool not intended for use upon metal, of the same material. One of the severest tests of keen edge holding quality is paper cutting; and high-speed knives in paper cutting machines are not to be compared with carbon steel knives in this respect. The same thing is true of other kinds of work that could be mentioned—in wood working especially.

Attention has been so concentrated upon the use of high-speed steel in metal cutting operations that its utility in other and perhaps unrelated industries has been all but overlooked. Now that it has been shown beyond question that high-speed cutters are highly efficient in wood working and others, besides the metal industries, it seems very probable that as the writer predicted some years ago, there will shortly be as great a revolution in these as in the metal cutting industries. First used for wood planer knives, high-speed steel is already largely employed for almost all sorts of wood working cutters; and there is every reason why it should be used still more largely.

Superiority in Wood-Working.

The cutting speeds obtainable with the old tools, applied to wood cutting, have seemed already tolerably good. With the new steels however, the feed (the reference now is to surface and form cutting) can easily be doubled and a much better finish obtained at the same time. Sixty feet a minute, as wood workers know, is considered a very high feed in planing and the like operations; and half as much is more nearly the average in most shops. With high-speed cutters a feed of a hundred and more feet is entirely practicable, regardless of the kind of wood, hard or soft, it is a matter of indifference to the knives, and the finish obtained has very little resemblance to that succession of ridges and depressions, to which we have been so long accustomed.

The edges, in all kinds of wood cutting, hold up remarkably, as may be seen from a typical instance. In a certain job of cutting dowels from very hard maple sticks, an ordinary cutter could not be made to work longer than half an hour, without re-honing. Even then it was necessary to set up the knife several times in order to get the dowels properly sized. A high-speed steel

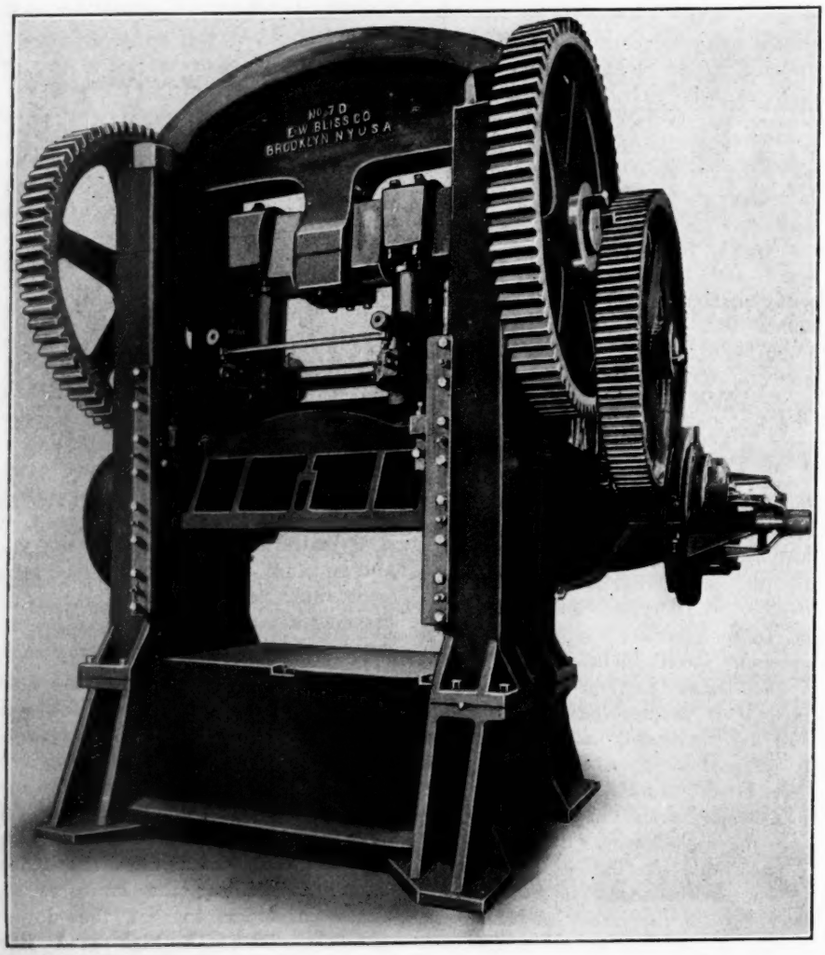
cutter easily runs 30 hours without sharpening, and at the end of that time is in excellent condition, apparently able to run considerably longer without any need for setting up. This is an efficiency of over 60 to 1 in the matter of sharpening alone, saying nothing at all of a possible increased rate of cutting. In most wood working jobs, sawing among the rest, the tools easily keep their edges from three to 10 or 15 times as long as the ordinary ones. The saving of time under these conditions is very evident.

The question has often been raised concerning the economy of high speed steel in cutting brass and metals other than iron and steel, and most usually it has been said that there is little, if any advantage. This is by no means a universal experience, for in certain shops they are used with a distinct saving on brass cutting; while in working other metals, as bronze and German silver, the saving in grinding is very marked indeed. An experience in milling German silver pieces is indicative of the many others. A carbon cutter mills 100 of a certain piece while a high speed cutter is in better condition after milling 5,000 of the same piece.

In conclusion it should be pointed out that there are high speed steels and yet other high speed steels. And while it is quite true that such steel is available and efficient in all the processes just indicated, and in many others as well, it does not necessarily follow that any one brand is adapted to all these several uses. Indeed for the most part they are not, though a very few seem to be of a composition which adapts them surprisingly well to a very great range of work. Others are more particularly adapted to certain kinds of operations, and still others seem to be altogether inferior.

A NEW BLISS DOUBLE-CRANK PRESS.

The machine shown in the accompanying illustration is a recent example of a double crank press designed and built by the E. W. Bliss Co., Brooklyn, N. Y. The press is designed for heavy cold bending, drawing and forming operations in the manufacture of articles of large dimensions from thick sheet steel, such as automobile engine crank cases, frame members, channels, etc., also for heavy cutting and perforating and general purposes for which presses of great power and wide dimensions between the columns are desirable.



Bliss Double Crank Press.

This particular machine is capable of exerting a safe working pressure of 800 tons. The driving power is applied through gearing to both ends of the crank shaft, thus dividing the bending and torsional strains, and consequently also greatly moderating the pressure on the main journals and the large gear teeth. The working strains are taken by four steel tension rods extending through the bed, frame and crown piece, binding these members together. The bases of the columns are broadened, and bolted and dowelled to the bed, independent of the tension rods, to resist side strains, and to provide support for the bearings of the intermediate driving shafts. The guiding ways in the frame columns are gibbed and adjustable from the front for alignment and wear. Provision is made for the application of direct knockout rods, also front and back knockout bars. The pitmans have large wearing surfaces and are provided with screw adjustment connected so as to provide for simultaneous action insuring parallelism between the lower surface of the slide and the bed of the press. The pitman screws are of liberal diameter and made of crucible cast steel, and the crank shaft is of high carbon open hearth steel. The gears are of cast steel, the pinions forged steel, and the teeth in all are machine cut.

The machine is controlled by a hand lever operating a specially designed combined friction clutch and brake.

The flywheel, which also serves as a driving pulley, is not keyed directly to the shaft, but is connected to a safety coupling which, by the shearing of a bolt, in case of excessive pressure, protects the press from injury. This safety attachment is a feature which many users of presses will realize to be of value.

The following are some of the principal dimensions of the machine: Width between frame columns, 74 inches; width between gibs, 67 inches; stroke of slide, 14 inches; distance from bed to slide, stroke down and adjustment up, 20 inches; adjustment of slide, 6 inches.

The flywheel is 48 inches diameter with 12½ inch face, weighs about 3,500 pounds, and makes 280 revolutions per minute. The total weight of the machine as shown is approximately 98,000 pounds.

NEWS FROM MANY INDUSTRIES

(In order to assist the post offices in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers:—

A. G. Percy Plow Co., Cold Water, Miss., $50,000, by A. G. Percy and others.

Valdosta Iron Co., Valdosta, Ga., $5,000, by D. P. Smith, C. D. Miller, E. E. Campbell.

J. F. Tillery Iron Co., Knoxville, Tenn., $10,000, by J. F. Tillery and others.

South Side Pattern & Model Shop, Chicago, Gustaf Staff, G. E. Staff, Paul A. Rzeppa.

Houston Mfg. Co., Rockford, Ill., $10,000, machinery, by E. P. Lathrop and others, Rockford.

Thos Bros. Co., Keokuk, Ia., $10,000, general machine shop, by William M. Thomas, J. A. Patterson, H. W. Thomas.

Republic Elevator & Machine Co., Rochester, N. Y., $30,000 by Fred A. Stoffel, 242 State street, Rochester, and others.

American Farm Machinery Co., Springfield, O., $50,000, by Read L. Bell, C. M. Root, B. F. Howell, W. N. Whitely, Jr.

The Ohio Motor Car Co., Carthage, O., $10,000, by Charles F. Pratt, James W. McCutcheon, Albert E. Shafer, Louis L. Townley, Ida A. Pratt.

Ross-Heaton Mfg. Co., Richmond, Va., $25,000. Metal Goods, E. J. Heaton, president; H. C. Cofer, secretary; E. S. Evans, treasurer.

South End Machine Co., Akron, O., general machine work, A. A. Reprogle, president; Fred Seidel, vice president; L. A. Cook, secretary and treasurer.

Hattiesburg Blow Pipe & Sheet Metal Co., Hattiesburg, Miss., $10,000, blowpipes for cotton gins, by T. J. Steffan and others.

Handley, McCartney Boiler Co., Bessemer, Ala., $50,000, by J. J. Pilgram and James McCartney, Mobile, and G. H. Stevenson, Bessemer.

Automatic Light Co. of Kansas City, Kansas City, Mo., $5,000, apparatus for the ignition of vapor engines, by N. T. Ladd and others.

St. Louis Heater & Mfg. Co., St. Louis, Mo., $50,000, heaters and hardware specialties, by Albert Badlein, Charles A. Gutke, William N. Tivy, Thomas P. Tivy, George E. Tivy.

New Construction:—

Plans are being drawn for an addition to the plant of the Atlas Brass Foundry, Columbus, O. The building will be of brick, two stories high.

The Kansas City Steel Scraper Co. is to build in Kansas City, Mo.

The DeSota Foundry & Machine Co., Mansfield, La., will build an extensive addition to its plant.

The Menominee Tool Co., Menominee, Mich., is preparing to build a plant in that city.

The W. S. Norman Sheet Metal Mfg. Co., Nevada, Mo., will erect a brick addition to its plant, 80 x 180 feet.

The Henderson Iron Works & Supply Co., Shreveport, La., is preparing to erect a foundry at a cost of $30,000.

The American Automatic Railway & Switch Co., Birmingham, Ala., is preparing to erect a factory for making an automatic street car switch.

Walter E. Dunn, Ogdensburg, N. Y., has bought land and will build a machine shop, foundry and warehouse. He builds gasoline engines.

A contract has been let by the Aetna Foundry & Machine Co., Warren, O., for the erection of a two and one half story structure to be used as a pattern shop.

The Wisconsin Auto Supply Co., Two Rivers, Wis., has decided to increase the size of its plant and add new equipment. The company will build gasoline engines for automobiles and for farm use.

W. J. Huey & Co., manufacturers of automobile accessories, Chicago, have leased property of the Spaulding estate at 2518 Michigan avenue, upon which the estate will build a three story building for the company.

The Keck-Gonnerman Machine Co., Mount Vernon, Ind., is engaged in building two additions to its works. One building is two stories high and 70 x 80 feet. It will be used as a power and light plant. The other is 40 x 100 feet and is intended to increase the pattern and storage room.

General Industrial Notees:—

The San Francisco Bridge Co. has received a contract from the government for the construction of the Pearl harbor dry dock, Hawaii, for $1,760,000.

The Central Foundry & Machine Co. is a new enterprise just established in Marion, Ind. The company will manufacture articles from gray iron, brass, bronze and aluminum.

The Berkshire Machinery Co., North Adams, Mass., has bought the Brooklyn foundry of that place and will use the plant for the manufacture of brass and iron castings. The working force in the foundry will be increased.

The foundry of the Guthrie School & Office Furniture Co., Guthrie, Okla., a recently established concern, has begun work on the castings for school desks.

Announcement has been made of the completion of negotiations for the purchase of the Middletown Car Works, Middletown, Pa., by the Standard Steel Car Co.

The Glasgow Iron Co., Pottstown, Pa., has advanced the price of puddling 25 cents a ton, making the rate $4. The rate is still 50 cents below the pay in prosperity times.

The Sapula Steel Rolling Mill Co., Sapula, Ok., has closed a contract for gas, which it will use for fuel and proposes to build an extensive plant there. The plant will be in the Oklahoma natural gas region.

The L. L. Jackson Foundry, Ashtabula, O., has been sold to the Barber Mfg. Co. at Ashtabula and the equipment will be removed to the Barber plant. Mr. Jackson will be foreman of the foundry for the Barber company.

The branch foundry of the Pennsylvania Foundry Co., York, Pa., which has been located at Glenville, Pa., has been moved to York, and is now in operation there. Other new buildings of the plant are progressing and the pattern shop has been completed.

The Hall Signal Co., Garwood, N. J., reports that its plant is running nights until 10 o'clock and that the force of men employed is the highest in its history. The company has a large number of orders on its books for railway equipment.

The Maryland Steel Co. has been awarded a contract for the construction of a collier for the United States navy. The vessel is to be of 12,500 tons cargo capacity, 14 knots speed and will cost $889,600. The contract is to be executed within 20 months.

The Southern Car Wheel Iron Co., of Tallapoosa, Ga., will be offered for public sale Oct. 1. The property includes a 40-ton charcoal iron furnace, an ore washing plant, 12 brick charcoal kilns of 60 cords capacity each, timber leases and mining privileges. A. V. Howe, of Tallapoosa, is trustee in charge of the plant.

The shops of the Louisville & Nashville railroad, at New Decatur, Ala., are still working on short time but the amount of work is increasing. The

forge shop which has been closed for several months was reopened recently.

Spang, Chalfant & Co., Inc., Pittsburg, have taken the contract to furnish 10 miles of 18-inch line pipe to the Kansas Natural Gas Co. for western shipment.

The Capital Lock-Nut & Washer Co., Columbus, O., which is in the hands of Charles Outhwaite as receiver, has been ordered sold Oct. 16. Efforts to reorganize the company have failed thus far.

The Charles A. Stickney Co., St. Paul, Minn., manufacturer of gasoline engines and pump jacks, is building an extension to its foundry 85 x 100 feet at a cost of $20,000. Equipment for the extension has been secured.

The Union Mining Co., Baltimore, Md., proprietor of the Mount Savage brick works, reports an order from one of the largest pig iron manufacturers in the east for fire brick linings for five stoves, 80 x 20 feet, the order being the second of the kind recently received.

Hickman, Williams & Co. have been appointed exclusive agents for the Silver Creek Furnace Co., of Rome, Ga. This furnace has been on charcoal iron, but will go in blast Sept. 15, on coke iron and will make coke iron for the remainder of the year.

The ships Ancon and Cristobal, which have been used in transporting cement to the canal zone, are now being ballasted for the return trips with about 500 tons each of scrap iron, which is to be sold in the open market in this country. The government has not succeeded in selling the canal zone scrap by contract, as they intended to do.

The Bullard Car Door Equipment Co., Birmingham, Ala., has accepted plans for the new plant which it is intending to build there, and it is hoped to have the plant complete early in 1910. J. A. Githens, formerly master mechanic of the Atlanta, Birmingham & Atlantic railroad, Fitzgerald, Ga., has been employed as superintendent of the plant.

The National Bolt & Nut Co., Pittsburg, Pa., has just completed additions to its plant at Sixty-first street and the Allegheny Valley railroad which will give a 25 per cent additional capacity in the hot pressed nut department. The capacity of the company is now between 5,000 and 6,000 kegs per month, operating single turn.

The Ohio State Boiler Co., Lorain, O., which was recently formed to handle a new type of boiler, announces that for the present it will have its product manufactured by contract and that negotiations are now pending with manufacturers. This arrangement will continue until spring, at least, when building plans may be undertaken.

The Mechanicsburg Foundry & Machine Co., Mechanicsburg, Pa., has bought the foundry buildings and equipment of the G. M. Yost Mfg. Co., which was formerly in business in Mechanicsburg, and is now operating the foundry on jobbing work. Gasoline engine castings will be the company's specialty. The company reports a number of orders ahead and the business outlook good.

New machinery for the pattern shop, 200 x 75 feet, being erected by the Scullin-Gallagher Iron & Steel Co., St. Louis, has been purchased from the J. A. Fay & Egan Co., and the machinery in the old shop is to be dismantled. The patterns to be made in the shop will be for the use of the company's steel foundry and for its customers.

The Dickson Car Wheel Co., Houston, Tex., has received an order from Mexico for 15,000 car wheels to be delivered during the coming year. Shipments will be made to the Mexican National, the Mexican International and the Mexican Central lines, all of which are under control of the Mexican government. For the past five years, the Dickson company has enjoyed the patronage of the Mexican lines, furnishing all of the wheels they use.

William H. Otley, Rusk, Tex., has transferred to Capt. William Wiess and associates, Beaumont, Tex., leases on 5,000 acres of iron land in Cherokee county, Tex. The transfer was made upon condition that the assignor show a perfect title. In Texas this transfer is connected with the recent visit of Charles M. Schwab to that state and Texans are hopeful that the deal is preliminary to the establishment of an iron industry there, but, when Mr. Schwab was seen recently in Pittsburg, no confirmation of that view could be obtained from him.

The International Steel Construction Co. is the name of a concern which will go into business in Evansville, Ind., shortly. The company proposes to manufacture steel scaffolding to be used in the construction of large buildings, steel mine doors, fire escapes, store fronts and other kinds of architectural iron work. A new plant with 94,000 feet of floor space is contemplated and a building formerly occupied by another factory will also be used. George Banenberger, formerly of the Superior Scaffolding Co., St. Louis, is to have charge of the plant.

The Wm. B. Pollock Co., Youngstown, O., recently sent a gang of men to the Hamilton Steel & Iron Co., Ltd., of Hamilton, Ont., where they were engaged in repairing furnaces for the Hamilton company. The furnaces on which the work was done were built by the Pollock company 10 years ago and have been in service ever since.

The Sebastian Lathe Co., Cincinnati, which has recently incorporated, is to take over a business carried on under the same name in Covington, Ky. The incorporators are Benjamin Sebastian, Jacob May, M. M. May and F. E. Webner.

A force of men has been put to work on the plant of the American Steel Foundries Co. at Sharon, Pa. The Franklin plant has been put to work and it is stated that the Sharon plant will be ready for operation about Oct. 1.

The Milwaukee Dry Dock Co., Milwaukee, Wis., announces its intention to begin work immediately on a machine shop at its Milwaukee yards which it is expected will be finished before the new year. The shop will be 40 x 60 feet and equipped to do heavy marine work. The company employes as high as 600 men and does a large business during the winter repairing boats laid up for the season.

Fires:—

The plant of the Palfrey Boiler, Foundry & Machine Co., Macon, Mo., was recently destroyed by fire. The damage is estimated at $12,000.

An overheated flask in the plant of the Globe foundry, Cincinnati, started a fire Sept. 3. The blaze was soon extinguished and the damage was small.

The plant of the Prizer-Painter Stove & Heater Co., Reading, Pa., was visited by fire Sept. 6. The damage is estimated at $40,000.

The plant of the Kings County Iron Works, Berry street, between North Thirteenth and North Fourteenth streets, Brooklyn, was destroyed by fire on the night of Sept. 1. The plant consisted of frame buildings and it is only a few weeks ago that a part of it was burned by a fire which broke out in an unexplained manner. The damage from the second fire is estimated at $25,000.

The Sedro-Wolley Iron Works, Sedro-Wolley, Wash., was visited by fire Sept. 1, and badly damaged. The office and pattern shop were the only parts of the establishment untouched by the blaze.

The machine shop of the Railway Steel Spring Co., Twenty-fifth and Smallman streets, Pittsburg, was nearly destroyed by fire, Sept. 6. Considerable machinery was also damaged. S. J. Foley, manager of the plant, states that it will be rebuilt at once.